RECORD OF DECISION

Breslube-Penn Superfund Site

Allegheny County, Pennsylvania

United States Environmental Protection Agency
Region III
Philadelphia, Pennsylvania

August 2007

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APPENDICES

PART I THE DECLARATION

1.0 Site Name and Location

Breslube-Penn Superfund Site
Moon Township, Allegheny County, Pennsylvania
CERCLA Identification Number: PAD08966795

2.0 Statement of Basis and Purpose

This Record of Decision (ROD) presents the Selected Remedy for the Breslube-Penn Superfund Site (the Site) located in Moon Township, Allegheny County, Pennsylvania. This remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act, (CERCLA), 42 U.S.C. §§9601 et. seq. and is consistent, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The decision is based on the Administrative Record for the Breslube-Penn Site, which has been developed in accordance with the Section 113 (k) of CERCLA, 42 United States Code §9613(k). This Administrative Record (AR) file is available for review at Coraopolis Memorial Library, State and School Streets, Coraopolis, Pennsylvania and the United States Environmental Protection Agency (EPA Region 3) Record Center in Philadelphia, Pennsylvania. The AR can also be obtained on the internet at www.epa.gov/arweb.

The Commonwealth of Pennsylvania concurs with the Selected Remedy. The letter is attached in appendix IV.

3.0 Assessment of the Site

The response action selected in this Record of Decision is necessary to protect public health or welfare or the environment from actual or threatened release of hazardous substances from the Site into the environment.

4.0 Description of the Selected Remedy

The Selected Remedy includes: excavation and consolidation of contaminated soils into a Waste Management Area (WMA) located on the Breslube-Penn property (the Facility); installation of a modified Resource Conservation and Recovery Act (RCRA) Subtitle C cap (modified RCRA cap) cover system with an impermeable membrane over the WMA to restrict direct contact and infiltration of precipitation into the soils; installation of a vertical slurry wall around the perimeter of the WMA to contain groundwater flow from WMA; followed by the placement of at least 2 feet of clean soil over the excavated areas: installation and operation of a product recovery system; maintaining and upgrading the existing fence to restrict access (to prevent vandalism) to the Facility; performance of enhanced monitored bio-attenuation for the contaminated groundwater outside of the WMA, and long-term groundwater and surface water

monitoring. EPA's Selected Remedy includes the following major components:

- Excavation of all off-facility contaminated soils above the groundwater table exceeding PCB performance standards of 1.5 mg/kg (residential cleanup levels) and consolidation into the WMA;
- Excavation of on-facility contaminated soils (removal of at least 2 feet) above the groundwater table outside the WMA exceeding PCB performance standards of 15 mg/kg (industrial cleanup levels) and consolidated into the WMA;
- Excavation of all contaminated soils outside the WMA and above the groundwater table which contain contaminants of concern (COCs) that exceed Pennsylvania's "Land Recycling and Environmental Remediation Standards Act" (ACT 2) soil to groundwater medium specific concentrations (MSCs) and/or are visually stained with light non-aqueous phase liquids (LNAPL) and consolidation into the WMA.
- Confirmative soil samples from the excavated areas shall be collected and analyzed to verify that no COCs are present above the performance standards in Table 22.
- Installation of a RCRA modified cap over the 4.7-acre WMA with an impermeable membrane to restrict direct contact and infiltration of precipitation into the soils;
- Installation of a 2 to 3-feet thick vertical slurry wall around the perimeter of the 4.7-acre WMA to contain groundwater flow from the source area at the WMA;
- If the cap and/or slurry wall containment system fails to meet performance standards, then Contingency 1: Extraction and Treatment of Groundwater within the WMA will be implemented to capture and/or contain the impacted groundwater within the WMA.
- Installation and operation of a product recovery system to remove floating and collectible LNAPL such as oil from the soil and the surface of the groundwater table;
- Installation of a fence to restrict access (for vandalism) to the Facility;
- Enhancement of in-situ bioattenuation through the injection of reagents to reduce concentrations of volatile organic compounds (VOCs) in groundwater outside the WMA to performance standards;
- If enhanced bioattenuation fails to meet performance standards, then Contingency 2: Extraction and Treatment of Groundwater will be implemented outside the WMA to remediate groundwater.
- Performance of long-term groundwater, surface water and slurry wall monitoring using a network of monitoring wells;
- Implementation of institutional controls (ICs) (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP) to restrict use of the Facility to preclude any disturbance of the WMA and to prevent potable use of contaminated groundwater; and
- The wetlands located on the WMA will be removed as part of the Selected Remedy and replaced in accordance with Section 404 of the Clean Water Act.

5.0 Statutory Determinations

Part 1: Statutory Requirements

The Selected Remedy attains the mandates of CERCLA §121 and the regulatory requirements of NCP. The Selected Remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable.

Part 2: Statutory Preference for Treatment

The Selected Remedy satisfies the statutory preference for treatment as a principal element of the remedy.

Part 3: Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted within five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

6.0 ROD Data Certification Checklist

The following information is included in the Decision Summary section of this Record of Decision. Additional information can be found in the Administrative Record file for the Site, the index of which can be found in Appendix III of this document.

- Chemicals of concern and their respective concentrations may be found in the "Summary of Site Characteristics" section.
- A discussion of source materials constituting principal threats may be found in the "Principal Threat Waste" section.
- Current and reasonably anticipated future land use assumptions are discussed in the "Current and Potential Future Site and Resource Uses" section.
- Estimated capital, annual operation and maintenance, and total present worth costs are discussed in the "Description of Remedial Alternatives" section.
- Key factors that led to selecting the remedy (i.e., how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, emphasizing criteria key to the decision) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections.

7.0 Authorizing Signature

James J. Burke, Director
Hazardous Site Cleanup Division
EPA Region III

8/30/07
Date

PART II DECISION SUMMARY

1.0 SITE NAME, LOCATION, AND DESCRIPTION

The Breslube-Penn Superfund Site (the Site) is located in Allegheny County, Pennsylvania, and has been identified as being located on both Ewing Road and at 84 Montour Road (see Figure 1). The Site encompasses the Breslube-Penn Facility (the Facility), a level, 7-acre tract of land in the flood plain of Montour Run in Moon Township. It also includes a small portion of the adjacent property owned by the Coraopolis Sportsmen's Association (CSA) which is traversed by Montour Run and located in Robinson Township. The Facility is an inactive industrial lot that was previously the location of a fuel oil recycling facility. The zoning designation of the Facility is M1, industrial, and the CSA property on the opposite side of Montour Run is zoned C4, limited commercial district.

A steep hillside borders the Facility to the north and west, and Montour Run (a perennial freshwater stream used for fishing) borders the Facility to the south and east. A recreational trail (the Montour Trail) is located along Montour Run between the Facility and the stream. A fence has been installed between the Facility and the Montour Trail to limit access to the Facility. Immediately south of the Montour Trail is the tract of land owned by the Coraopolis Sportsmen's Association.

The northern portion of the Facility consists of a hardwood forest on a steeply sloped hillside. The southern portion of the Facility, previously used for industrial purposes, consists of open field/scrub-shrub areas surrounding a large concrete pad and several concrete building foundations. Several small wetlands were previously identified on the Facility, however only one small wetland remains. This small wetland is located along the northwestern boundary of the Facility. Figure 2 presents the topographic plan for the Facility and areas immediately adjacent to the Facility.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 Site History

The Pennsylvania Department of Environmental Protection (PADEP) records indicate that Facility operations commenced in the 1970's when American Tallow established a meat rendering plant on the Facility. This operation closed in 1977 and Wiseman Oil Company (Wiseman Oil) took over the property to operate a used oil processing and reclamation facility. Wiseman Oil refined used oils into fuel oil for sale to residual fuel users and manufactured lubricating oil from the used oils. This process generated a clay filter cake waste that was stockpiled on the property.

American Tallow and Wiseman Oil operated a lagoon on the southwestern end of the property, which allegedly received oily plating waste, which is a listed waste under the Resource Conservation Recovery Act (RCRA). The exact date that the lagoon was constructed and put

into operation is unclear. However, it is certain that the lagoon began receiving wastes between 1968 and 1975. In 1979, the lagoon was reportedly backfilled, but the waste was not removed from the lagoon prior to backfilling. Samples of accumulated sludge material within diked areas surrounding on-facility oil storage tanks reported detections of polychlorinated biphenyls (PCBs).

In 1982, Wiseman Oil declared bankruptcy and the property was bought by Breslube-Penn, Inc. (Breslube-Penn). Breslube-Penn continued used oil reprocessing operations, built storage tanks on the former lagoon area, and constructed a lubricating oil refining plant. Clay filter cake waste continued to be produced and stockpiled on the Site. A 1984 inspection by the Allegheny County Health Department noted that sludge and oil had accumulated in the diked areas around several storage tanks. The inspection identified two outfalls discharging to Montour Run. These outfalls discharged plant storm water run-off, wastewater, and stripper column water. Breslube-Penn discontinued fuel oil reprocessing around 1986. The Facility was used as a used oil transfer station from 1987 through 1992, at which time operations at the Facility ceased. Figure 3 shows possible source areas at the Site.

2.2 Previous Investigations and Enforcement Activities

A number of environmental activities have been performed at the Facility with regard to soil, surface water, sediment, groundwater, and waste characterization. In 1987, Breslube-Penn Inc. signed a Consent Order with the Pennsylvania Department of Environmental Resources, now the Pennsylvania Department of Environmental Protection. The order required the Facility to remove the large fuel storage tanks and all oil-contaminated soil, complete a groundwater study, and comply with all PADEP regulations. Breslube-Penn drained some of the tanks and installed six monitoring wells on and around the Facility, but later fell out of compliance with the Order.

In October 1988, EPA conducted a Site Inspection at the Facility. Soil samples were collected from a soil staging area, the filter cake storage area, and other areas of suspected soil impacts. The analytical results from these soil samples indicated the presence of VOC, semi-volatile organic compounds (SVOCs), PCBs, metals, and cyanide. Groundwater samples collected from apparent downgradient monitoring wells also contained VOCs, SVOCs, PCBs, and metals. Sediment and surface water samples were collected from Montour Run in one location upstream and one location downstream of the Facility. Several polynuclear aromatic hydrocarbons (PAHs) were detected in the sediment sample collected upstream of the Facility. One PCB, Aroclor 1260, was also detected in the upstream sediment sample. No organic constituents were detected in the downstream surface water and sediment samples. Metals were detected in the upstream and downstream sediment samples, but the upstream sample contained higher metal concentrations than the downstream sample.

In 1990, Breslube-Penn Inc. excavated and moved staged wastes and a portion of the filter cake waste to a new pile located in the western section of the property. EPA conducted an Expanded Site Inspection at the Facility in April 1991. Soil samples collected from the staged waste area contained detectable concentrations of VOCs, SVOCs, PCBs, metals, and cyanide. Samples

from the filter cake area contained detectable concentrations of PCBs and lead. Several metals were detected in sediments collected from a drainage pipe leading from the Facility to Montour Run.

In June 1993, EPA conducted a Removal Site Assessment at the Facility to determine if an imminent threat to human health or the environment existed, and to determine the necessity for a removal action. EPA determined that a Removal Action was warranted based on the results of the assessment. The primary source to be addressed during the Removal Action was a stockpile, approximately 90 feet wide, 145 feet long, and 30 feet high, located in the western portion of the Facility. Analytical results for soil samples collected from the waste stockpile included PCBs (Aroclor 1260) at levels between 44 and 137 milligrams per kilogram (mg/kg) and lead at levels between 640 and 950 mg/kg.

Based on the 1993 Site Assessment, EPA negotiated an Administrative Order on Consent (AOC) with Breslube-Penn Inc. for the performance of a Removal Action. EPA and PADEP records indicated that Breslube-Penn fell out of compliance with the Order on June 14, 1994. At that time, EPA mobilized to the Facility to implement the Removal Action. By the end of the Removal Action, EPA had removed a total of approximately 6,400 tons of PCB- and lead-containing filter cake waste. Sampling of test pits conducted by EPA during the Removal Action demonstrated the presence of PCBs (Aroclor 1260 and 1254) and lead at depths of up to 15 feet. Based on the sampling performed during EPA's Removal Action, numerous chemicals were identified at the Facility.

The Site was proposed to the National Priorities List (NPL) on October 2, 1995 and formally added to the list on June 17, 1996.

In 1997, the Pennsylvania Department of Health (PADOH) conducted a Public Health Assessment for the Facility. The Public Health Assessment was prepared by the PADOH under cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). The summary of the Public Health Assessment concluded that the Facility was not an apparent public health hazard and that there were no known exposure pathways at the Facility that had a significant impact on public health. Although the PADOH document concluded that there was no apparent public health hazard at the Site, the PADOH recommended additional characterization of the Facility.

In 1997, EPA initiated a Remedial Investigation and Feasibility Study (RI/FS) at the Site and selected a remedial contractor to perform the RI/FS. As a part of the RI/FS, EPA's contractor performed geophysical surveys and prepared Facility maps. A number of areas were identified as potential buried waste trenches or pits. In 1997, EPA began sending Special Notice Letters to identifiable parties that had sent waste to the Site regarding their liability for the cleanup of the Site. Under CERCLA, these companies, in addition to former owners/operators at the Site, have potential responsibility for the Site cleanup. A group of companies formed a working group and started negotiations with EPA to perform the RI/FS.

In 1997, the United States filed a complaint against Amcast Industrial Corporation for past and future response costs associated with the Site. In 1998, the United States filed an amended complaint naming over 40 additional defendants (PRPs – potentially responsible parties) for past and future response costs associated with the Site.

In February 2000, several defendants (CBS Corporation, Exxon Mobil Corporation, Ford Motor Company, General Motors Corporation, Hussey Copper Ltd., Kaiser Aluminum & Chemical Corporation, and USX Corporation), referred to as the Work Group, after lengthy negotiations with EPA, signed an Administrative Order on Consent to perform the RI/FS. EPA changed the scope of work for its contractor to conduct oversight of the PRP contractor's performance of the RI/FS.

On August 24, 2000, in response to a joint motion to stay the cost recovery litigation, U.S. v. Allegheny Ludlum Corp., et al., filed by the government and the majority of defendants, the district court removed the above cost recovery case from the active docket and administratively closed the case (although the case can be returned to the docket upon written request of any party). The parties had moved for a stay to allow work on the RI/FS to proceed and to foster possible settlements.

On March 5, 2005, during the final stages of the RI, the Work Group invoked the dispute resolution provision of the Administrative Order on Consent due to EPA's February 14, 2005 letter and attached table, requiring the Work Group to consider future residential risk scenarios for groundwater. Specifically, with respect to future residential risk scenarios, the EPA in its February 14, 2005 letter, required that the Work Group: 1) use EPA risk estimates in preparing the feasibility study and 2) consider specifically those COCs that EPA had identified. Following exchanges of written correspondence, on May 11, 2005, the Work Group withdrew its objections agreeing to consider future residential risk scenarios in the development of remedial alternatives only where the RI contained no corresponding estimate. However, in arriving at this agreement, EPA decided that the Work Group did not need to incorporate EPA's quantitative estimates in the RI report (as these estimates would be included in the administrative record) but that the RI would state, based upon EPA's evaluation, that the residential risks in groundwater, "would exceed 1E-4 for cancer" and "would exceed a Hazard Index of 1."

From 2005-2006, during this stay of the litigation, the United States entered into three *de minimis* settlements to resolve certain parties' CERCLA liability at the Site. The three *de minimis* settlements recovered $1,629,496.50.

Also, in December 2005, during the *de minimis* process, the United States filed a Second Amended Complaint naming an additional nine parties. In July 2006, a Third Amended Complaint was filed to correctly identify parties named in the Second Amended complaint

On December 6, 2006, the FS was completed. In February 2007, an addendum to the FS was completed. The Proposed Plan was completed soon thereafter in March 2007.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan and supporting documentation for the Breslube-Penn Site in Allegheny County, Pennsylvania were made available to the public on March 30, 2007 at the EPA Region III Public Reading Room at 1650 Arch Street, 6th Floor, in Philadelphia, PA and in the Information Repository at the Coraopolis Memorial Library at State and School Streets in Coraopolis, PA. EPA issued a notice in the *Pittsburgh Post-Gazette* on April 14, 2007 which contained information relevant to the duration of the public comment period, the date of the public meeting, and the availability of the Proposed Plan and the entire Administrative Record. The public comment period was held from March 30, 2007 through April 30, 2007. In addition, a public meeting was held on April 18, 2007 at Council Chambers, 1012 5th Avenue, Coraopolis, PA. The purpose of the meeting was to inform local officials and interested citizens about the Superfund process, to discuss the Proposed Plan, to receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties. Responses to comments and questions received at the public meeting and in writing throughout the public comment period are included in the Responsiveness Summary, which is part of this Record of Decision.

The Proposed Plan identified Alternative 4 (**the same alternative is identified as Alternative 3 in this ROD, see table below**) as the Preferred Alternative. Alternative 2 mentioned in the Proposed Plan is not considered in this ROD. As explained in the Proposed Plan Section VII, under the heading *Overall Protection of Human Health and the Environment* (page 33), Alternative 2 described in the Proposed Plan does not meet the Proposed Plan's Remedial Action Objectives (RAOs) of preventing or reducing the migration of contaminated groundwater from the source area, and therefore it was eliminated from the consideration in this ROD. Thus, the sequence of the alternatives was changed as follows:

Explanation of the difference from the Proposed Plan		
Propose Plan Alternatives Numbers	ROD Alternatives Numbers	Changes
1	1	Retained
2	-	Eliminated
3	2	Retained
4	3	Retained
5	4	Retained
6	5	Retained

4.0 SCOPE AND ROLE OF RESPONSE ACTION

This Record of Decision addresses contaminated soil, groundwater, surface water, and sediment at the Breslube-Penn Superfund Site. It is EPA's belief that the Selected Remedy presented in this ROD will address the risks posed by the release or threat of release of hazardous substances from the Site. Investigations concluded that impacts from the Site to surface water and sediment in Montour Run were not evident and that ingestion and dermal contact with surface water and sediment in Montour Run do not pose an unacceptable risk or adverse health effect to current or future recreational users. Surface water and sediment in on-site wetlands were found to be contaminated. These wetlands will be removed as part of the Selected Remedy and replaced in accordance with Section 404 of the Clean Water Act. Because the Site is being addressed in its entirety by this ROD, no other operable units are planned.

5.0 SUMMARY OF SITE CHARACTERISTICS

5.1 Site Geology and Hydrogeology

The Site lies in the Appalachian plateau physiographic province of the Appalachian region. At the Facility, 10 to 28 feet of fill and/or native soils overlie the sandstone and siltstone bedrock. The fill consists of cinders, coal fragments, and silty soils. Native soils at the Site consist of varying amounts of gravel, sand, silt, and clay. Bedrock in this region consists of Pennsylvanian-aged sandstone, siltstone, and shale sequences with occasional coal stringers.

Groundwater beneath the Site occurs in the fill and native soil (unconsolidated materials) as well as in the uppermost saturated bedrock. The unconsolidated materials and the bedrock appear to be hydraulically connected due to the absence of laterally continuous clay or silt layers (i.e., aquitards). Groundwater flow direction across the Facility is generally to the east and can vary from northeast to southeast. Figures 4 and 5 show the flow direction of groundwater in the shallow and bedrock aquifers, respectively.

Vertical groundwater flow direction is downward in the western and central portions of the Facility, and upward closer to Montour Run. The detection of constituents of concern in the shallow groundwater south of Montour Run indicates that a portion of the groundwater flows beneath the stream.

Depth to groundwater is as follows:

- On-facility shallow groundwater: 5 to 16 feet below ground surface (bgs)
- Off-facility shallow groundwater: 5 to 8 feet bgs
- On-facility bedrock groundwater: 8 to 12 feet bgs
- Off-facility bedrock groundwater: 4 to 21 feet bgs

Two active groundwater wells are located within 0.25 miles of the Facility on the opposite (eastern) side of Montour Run and service residential homes. These wells, situated northeast of

the Facility along North Petrie Road, are approximately 90 to 100 feet bgs. These residents chose not to be connected to the available municipal water supply and use their well water as a potable water source. Based on monitoring data collected during the Remedial Investigation, these two homes have not been impacted by groundwater contamination associated with the Site. There are also residents that live nearby that are connected to the municipal water supply and are using the public water as a potable water supply.

5.2 Surface Features and Surface Water Hydrology

The northern portion of the Site consists of a hardwood forest on a steeply sloped hillside. Surface water run-off generally drains westward across the Site toward Montour Run, a perennial stream which borders the Facility to the south and east. Montour Run flows northward past the southern portion of the Site for about one mile, and joins the Ohio River Back Channel at Neville Island.

Several small wetlands were identified on the Facility. The wetlands were concentrated along the southwestern boundary of the Facility, except for one small wetland located along the eastern Facility boundary. These wetlands appeared to be maintained by surface water run-off, groundwater seepage, and topographic depressions. Currently, however, only one small wetland along the northwestern boundary of the Facility remains. Figure 2 presents the topographic plan for the Facility and areas immediately adjacent to the Facility.

5.3 Ecology

An ecological reconnaissance of the Site and adjacent areas was performed in March 2000 to identify and assess habitats and potential ecological receptors inhabiting these areas. Six habitat types were identified at the Site. These habitats include mature forest, early successional disturbed forest, early successional scrub-shrub habitat, early successional open field habitat, herbaceous/shrub wetlands, and disturbed land (paved and unvegetated areas). The forested habitats on the Site are contiguous with large areas of unbroken forest habitat extending off-site to the north and west. This connection with off-site forested habitat may facilitate wildlife movement onto and off of the Site. The preferred habitat (i.e., wooded stream banks and slopes) for the Pennsylvania proposed endangered species *Meehania cordata*, heartleaf meehania, exists in the Site area; however, no individual plants or aboveground vegetative structures exist.

Montour Run appears to be a perennial stream system, based upon the size of the contributing watershed area and the observed flow characteristics of the stream. The study area for the Site encompasses a stream segment of approximately 4,000 feet of Montour Run adjacent to the Site. The study area supports a variety of aquatic habitats, as defined by Bain and Stevenson (1999), including riffles, runs, pools, and glides. Habitat fragmentation along Montour Run may somewhat limit the movement of wildlife along the stream corridor. As stated previously, one small wetland exists along the northwestern boundary of the Facility.

Potential ecological receptors identified on and near the Site include: soil invertebrates (e.g.,

earthworms), birds (e.g., American robin, red-tailed hawk), amphibians (e.g., toad), macroinvertebrates, fish, and mammals (e.g., meadow vole, white-tailed deer). Potential plant receptors include: wetlands vegetation (e.g., cattails, rushes), mature trees (e.g., maples, elms, oaks), saplings/shrubs (e.g., multiflora rose), and ground cover (goldenrod, yarrow, aster).

5.4 Nature and Extent of Contamination

The Work Group performed an RI at the Site from October 2000 through March 2003. The purpose of the RI was to characterize Site conditions, determine the nature and extent of contamination detected in the environmental media on the Facility and off the Facility, and assess the risks to both human health and the environment. The RI was conducted in five phases. It started with an on-facility (the contamination source area) investigation and was expanded to off-facility media to find the extent of contamination. During the course of the RI and all previous investigations, several media were identified and sampled to determine whether they were sources of chemical constituents that presented a potential ecological or human health risk. These media included: surface soil, subsurface soil, groundwater, surface water, and sediment.

5.4.1 Surface Soils

Soil in the formerly active production area was found to be highly contaminated. The results of the surface soil evaluation concluded that various SVOCs, PCBs, and metals are present at levels exceeding industrial Risk Based Concentrations (RBCs) on the Facility and residential RBCs on other portions of the Site. Dioxins/furans were present at levels exceeding industrial RBCs in on-facility soils only. Contaminated soils from the southwest corner of the Facility have migrated off the Facility, contaminating a small area of the CSA property with SVOCS, PCBs, and metals. The levels of some chemicals in background surface soil samples were also noted to exceed industrial RBCs. Tables 1 and 2 summarize the contaminants found in on-facility surface soil and off-facility surface soil, respectively.

5.4.2 Subsurface Soils

The results of subsurface soil evaluation concluded that VOCs, various SVOCs, PCBs, and metals were present in on-facility and off-facility subsurface soils at levels exceeding industrial and residential RBCs. Dioxins/furans and tetrachloroethene were detected at concentrations above industrial RBCs in on-facility subsurface soils only. Soils contaminated with SVOCs, PCBs, metals, and dioxins/furans have been found on-facility at depths up to 12 feet bgs. Tables 3 and 4 summarize the contaminants found in on-facility and off-facility subsurface soils, respectively.

5.4.3 Groundwater

The results of the groundwater evaluation concluded that various VOCs, SVOCs, PCBs and metals were present in shallow groundwater and bedrock groundwater at levels exceeding drinking water standards (MCLs) and EPA Region 3 RBCs for tap water. LNAPL (consisting of

a mostly floating used oil layer) was also discovered in the groundwater underneath the Facility. Figure 6 shows the approximate extent of the LNAPL and oil staining in soils. Table 5 summarizes the contaminants detected in the LNAPL. Tables 6 and 7 summarize the contaminants found in alluvial and bedrock on-facility groundwater, respectively.

The groundwater data from shallow monitoring wells downgradient of the WMA indicate that some COCs have migrated in groundwater, downgradient of the property. Several COCs were detected in groundwater samples collected from shallow monitoring wells installed on the north side of Montour Run. These data suggest that Montour Run receives some but not all of the shallow groundwater discharge from the Facility, however, this level of discharge is not adversely affecting the quality of Montour Run. Analytical results of groundwater samples collected from bedrock wells installed on adjacent off-facility properties and on the south side of Montour Run indicate that COCs have migrated from the Facility through the fractured bedrock system. Concentrations of COCs in off-facility bedrock groundwater samples exceeded drinking water MCLs and Region 3 RBCs for tap water. Groundwater downgradient of the WMA was contaminated with VOCS, SVOCS, PCBs, and metals. Groundwater contamination levels decreased with distance from the Facility. Tables 8 and 9 summarize the contaminants found in alluvial and bedrock off-site groundwater, respectively.

No known groundwater users were identified in areas where COCs were detected in the bedrock groundwater. Two residential wells, which are located 0.25 miles southeast of the Site and beyond 1000 feet from the edge of the contaminated groundwater plume, were identified during the investigation. Analytical results of groundwater samples collected from these residences confirmed the absence of detectable levels of COCs.

5.4.4 Air

Volatile constituents may potentially migrate into air. On-facility trespassers and both on-facility and off-facility construction workers may be exposed via inhalation of VOCs volatilized from shallow groundwater into outdoor air. Both on-facility and off-facility industrial workers could potentially be exposed to contaminants volatilized from shallow groundwater into enclosed building spaces or into the outdoor air. Tables 10 and 11 summarize the contaminants found in alluvial on-facility and off-facility groundwater.

Exposure to volatilization of organic compounds from shallow groundwater into outdoor air were evaluated using equations and methodologies described in EPA's "Air/Superfund National Technical Guidance Study Series, Guidelines for Predictive Baseline Estimation for Superfund Sites (EPA, 1996). The outdoor ambient air concentrations were calculated by multiplying contaminant concentrations in groundwater by a volatilization factor as outlined in the document, "Standard Guide for Risk-based Corrective Action" (ASTM, International, 1998).

Exposure to volatilization of organic compounds from shallow groundwater into indoor air was predicted using the Johnson and Ettinger (1991) algorithm. For evaluation in the human health risk assessment, the advanced groundwater (GW-ASV) model (version 3) was used to calculate

concentrations of contaminants in ambient indoor air. The calculated air concentrations were used as input in the risk calculations to estimate risks and adverse health effects to future onsite commercial workers from exposure to contaminants volatilized from shallow groundwater into basements and building foundations.

5.4.5 Surface Water

The surface water evaluation concluded that Arochlor-1260, bis(2-ethylhexyl) phthalate, arsenic, lead, and manganese were present above screening criteria (e.g., Region 3 Tap Water RBCs x 10) in the Facility wetlands. No current manifestations of the discharge of impacted groundwater from the Facility into Montour Run were identified. Bis(2-ethylhexyl) phthalate and arsenic were detected in Montour Run surface water samples at concentrations in excess of the screening criteria. The results of statistical comparisons of the upstream and downstream samples indicated that the data were not significantly different. Prior evaluations of the surface water data also concluded that impacts from the Site to Montour Run surface water were not evident. Tables 12 and 13 summarize the contaminants found in on-site wetlands and in surface water in Montour Run, respectively.

5.4.6 Sediment

The sediment evaluation concluded that dioxins/furans, Arochlor-1260, arsenic, iron, lead and vanadium, were present at levels exceeding the screening criteria (e.g., Region 3 Tap Water RBCs x 10) in the Facility wetlands. Arsenic, iron, manganese and vanadium were present in Montour Run sediments at levels exceeding the screening criteria. The results of statistical comparisons of the upstream and downstream sediment samples indicated that the upstream and downstream data were not significantly different. Prior evaluations of the sediment data also concluded that impacts from the Site to Montour Run sediments were not evident. Tables 14 and 15 summarize the contaminants found in sediment.

5.4.7 Principal Threat Waste

At the Breslube-Penn Site, the LNAPL is a source material that meets the definition of a principal threat waste. In addition, the concentrations of PCBs in the LNAPL exceed 500 ppm, which is the threshold specified in EPA's *Guidance for Remedial Actions at Superfund Sites with PCB Contamination*, for a principal threat PCB waste. For more information on the principal threat waste, see Section 11.0.

5.4.8 Site Conceptual Model

A conceptual model of the Site was developed to identify which human exposure pathways pose a threat to human health. The initial Site Conceptual Model can be found in Figure 7. Based on potential release and transport mechanisms, potential receptors may be exposed to constituents in surface soil, subsurface soil, groundwater, onsite wetland surface water, onsite wetland sediment and ambient air (chemicals volatilized from shallow groundwater). Further discussion of

potential exposure pathways is presented below in Section 7, Summary of Site Risks. The potentially complete exposure pathways retained for quantitative evaluation in the risk assessment are shown on the Final Site Conceptual Model (see Figure 8). Details related to the human exposure pathways, such as timeframe (current or future use), medium, exposure point, receptor population and rationale for selection are provided in Table 16.

Information on habitat types and wildlife observations for the Site and adjacent areas were used to prepare a Conceptual Site Model for potential ecological receptors (see Figure 9). The model assumes that historical Site operations may have resulted in the potential release of contaminants to soil, groundwater, and biota. In general, complete exposure pathways consist of a source of the contaminants, a release and/or transport mechanism for the contaminants, and direct or indirect contact by a receptor. An exposure pathway assessment was conducted to evaluate the intensity, frequency, and duration of actual or potential ecological exposures to contaminants of interest in environmental media. Evaluation of exposure is accomplished by obtaining information regarding the concentrations of contaminants in soil and groundwater along with information on how an ecological receptor deemed appropriate for the Site may be exposed to these media. The most relevant pathways for exposure of ecological receptors to contaminants off-site include the following: (1) uptake of contaminants by plants from off-site soil and shallow groundwater; and (2) food chain transfer by ingestion of contaminants in affected media and biota (i.e., bioaccumulation). Further discussion of potential exposure pathways is presented below in the Summary of Site Risks section.

6.0 CURRENT AND POTENTIAL FUTURE SITE USE AND RESOURCE USES

The zoning designation for the Facility, which is located in Moon Township, is M1, industrial, whereas the off-facility property, including the Montour Trail and the CSA property on the opposite side of Montour Run (Robinson Township), is zoned C4, limited commercial district. The Coraopolis Sportsmen's Association has imposed a proprietary land use restriction (i.e., a deed restriction) on the CSA property. The deed restriction prohibits the use the CSA property for residential development or health care or educational facility operations and also prohibits the use of groundwater on or from the CSA property. Based on the current zoning, future use of the Facility area is expected to remain unchanged. However, the off-facility property is private and could potentially be used for residential development.

There are 35 people within 0.25 miles and 94 people within 1.0 miles of the Site who utilize groundwater. One inactive and two active groundwater wells are located within 0.25 miles of the Site on the opposite side (eastern) of Montour Run. The inactive well is located on the adjacent CSA property. The CSA is now connected to the public water supply and does not use this well for drinking water purposes. Additionally, the current deed restriction applicable to the CSA property prohibits the use or construction of groundwater wells on the CSA property. The two active groundwater wells are located approximately 0.25 miles northeast of the Facility and beyond 1000 feet from the edge of the plume along North Petrie Road. These drinking water wells were installed into bedrock approximately 90 to 100 feet below ground surface and, after they were put into service, several Township and County ordinances were passed prohibiting the

use of groundwater in the vicinity of the Site for public consumption. The existence of the County regulation (Allegheny County Health Department Regulation Section 225.2 and the Moon Township Subdivision and Land Development Ordinance, Article, §188-401(A)(1)) and Township ordinances that require the use of public water supplies, along with the deed restriction on the CSA property that prohibits the installation of wells, provides some assurance that groundwater downgradient of the Facility will not be used for future water supplies and human ingestion. However, there remains a potential for future use of groundwater downgradient of the facility for water supplies and human ingestion due to EPA's inability to control the zoning or deed restrictions of adjacent properties owned by third party non defendants, who, despite their current voluntary restrictions, can at any time, and for any reason, change these restrictions without notice to or approval by EPA

7.0 SUMMARY OF SITE RISKS

Based on the results of the RI, a risk assessment was conducted and included in the RI Report for the Breslube-Penn Site. A risk assessment is an analysis of the potential adverse human health and ecological effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these hazardous substances under current and anticipated future land use. The risk assessment for the Breslube-Penn Site is included in the RI Report for the Site and is available in the Administrative Record file. In addition to the risk assessment completed in the RI, EPA performed its own risk assessment to supplement omissions in the RI which is included in the administrative record.

7.1 Summary of Human Health Risk Assessment

A Superfund baseline human health risk assessment (HHRA) is an analysis of the potential adverse health effects caused by hazardous substance exposure from a site in the absence of any actions to control or mitigate these hazardous substances under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

7.1.1 Hazard Identification

In this step, the Contaminants of Interest (COIs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified, based on factors such as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment; concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

The COIs are screened against risk-based screening criteria to identify COCs. Any COIs which exceed Risk Based Concentrations (RBCs) are identified as a COCs to be carried through the risk assessment. The COCs of concern exceeding the initial risk-based screening criteria at the Breslube-Penn Site are summarized in Table 22.

7.1.2 Exposure Assessment

In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment included, but are not limited to, the concentrations to which people may be exposed and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

The Exposure Assessment step evaluated the current and future land use and the potential receptor populations at the Breslube-Penn Site to determine the potential routes of exposure. These are summarized in Table 16. Although it is unlikely that the Facility and adjacent off-facility property land use will change, EPA evaluated future residential use scenarios because the privately owned off-facility area could someday be developed as a residential area. The residential receptor was evaluated because it was the most sensitive potential receptor. Exposures to groundwater, soil, surface water, and sediment, both on and off the Facility, were examined for the following scenarios.

Groundwater:

- Future residential and industrial use of shallow groundwater beneath the Facility property as a potable water supply.
- Construction worker and recreational user of shallow groundwater beneath the Facility as a potable water supply.
- Future residential use of the bedrock groundwater beneath the Facility property as a potable water supply.
- Future residential and industrial use of shallow groundwater off-facility.
- Future residential use of off-facility bedrock groundwater as a potable water supply.

Soil:

- Future residential exposure to on-facility surface soil.
- Trespasser and industrial worker exposure to on-facility surface soil.
- Exposure of future construction workers on the Facility to a combination of surface and subsurface soil.
- Future residential exposure to on-facility subsurface soil.
- Future residential exposure to off-facility surface soil.
- Recreational user and industrial worker exposure to off-facility surface soil.
- Exposure of future construction workers to a combination of off-facility surface and subsurface soil.
- Future residential exposure to off-facility subsurface soil.
- Incidental trespasser exposure to wetland surface water and sediment on the Facility.
- Incidental trespasser/recreational exposure to Montour Run surface water and sediment.

7.1.3 Toxicity Assessment

In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure and severity of adverse health effects are determined. Potential health effects are contaminant-specific and may include risk of developing cancer over a lifetime and other noncancer health effects, such as changes in the normal function of organs within the body (e.g., changes in the effectiveness of the immune system). Some contaminants are capable of causing both cancer and noncancer health effects.

EPA has developed dose-response assessment techniques to assess risks associated with chemicals in the environment and set "acceptable" levels of human exposure.

The EPA uses a two-step process for evaluating the potential carcinogenic effects of chemicals. The first step is to review the available scientific data and literature to determine whether there is an association between the chemical and cancer in humans or animals. Based upon the results of this review, the substance is then assigned a "weight-of-evidence" classification that reflects the likelihood that the chemical is a human carcinogen. In the second step, a cancer slope factor (CSF) is calculated, applying appropriate uncertainty factors, for known or probable human carcinogens.

CSFs are derived by the EPA from the results of chronic animal bioassays, human epidemiological studies, or both. CSFs that are available for the COIs at the Breslube-Penn Site are listed in Tables 17 and 18. To date, EPA has developed CSFs only for the oral and inhalation routes of exposure. In the absence of values specific to the dermal route, EPA guidance indicates that the oral factors may be used to evaluate dermal exposures.

Potential non-carcinogenic effects resulting from human exposure to chemicals are generally estimated quantitatively using reference doses (RfDs) for ingested chemicals and reference concentrations (RfCs) for inhaled chemicals. As was the case for CSFs, RfDs and RfCs are only available for the oral and inhalation exposures. In the absence of criteria specific to the dermal pathway, oral values are used to evaluate the dermal route of exposure. RfD and RfC values have been developed on the basis of a wide array of noncarcinogenic health effects. The RfD, expressed in units of mg/kg/day, is an estimate of the daily maximum level of exposure to human populations that is not likely to produce an appreciable risk of deleterious effects during a designated time period of exposure. The RfC is expressed in units of milligrams of chemical per cubic meter of air (mg/m^3) and is an estimate of the maximum air concentration that can be present over a specified time period without an appreciable risk of deleterious effects. RfDs and RfCs are usually derived from either human studies involving work place exposures or from animal studies. The RfD and RfC provide benchmarks against which human intakes of chemicals resulting from exposure to environmental media are compared. Duration of exposure is also considered in the development of RfDs and RfCs and is categorized as acute, subchronic, or chronic. Exposure durations for complete exposure pathways used in the Breslube-Penn risk assessment include subchronic and chronic exposures. Therefore, both subchronic and chronic

RfDs and RfCs have been used. The EPA-developed RfDs and RfCs that are available for the COIs are provided in Tables 19 and 20.

7.1.4 Risk Characterization

This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 1E-4 cancer risk means a "one-in-ten-thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 1E-4 to 1E-6 (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk) with 1E-6 being the point of departure. For noncancer health effects, a hazard index (HI) is calculated. To determine the HI, the ratio of the individual exposure levels to a non-carcinogenic compound presented by site conditions compared to the corresponding reference doses. If this ratio exceeds 1, there is a potential for impact based on hazards from that particular compound. These ratios can be added for exposure to multiple contaminants. The sum, known as the HI, is not a mathematical prediction for the severity of toxic effects, but rather a numerical indicator of the transition from acceptable to unacceptable levels. The key concept for a non-cancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which non-cancer health effects are not expected to occur. A higher HI generally indicates greater potential for adverse health effect.

The human-health estimates for the Breslube-Penn Site are based on current reasonable maximum exposure scenarios and were developed by taking into account various conservative estimates about the frequency and duration of an individual's exposure to the COIs in the various media that would be representative of site risks, as well as the toxicity of these contaminants. As explained earlier, EPA typically requires a remedial action at a site when the carcinogenic risk level exceeds 1x1E-4. For non-cancer health effects, a remedial action is triggered when the HI exceeds 1. Cancer risks are summarized in Table 21. The following general conclusions were made.

Groundwater:

- Risks to future residential users from use of shallow groundwater beneath the Facility as a potable water supply would exceed EPA risk goals because of lead, VOCs, SVOCs, PCBs, and metal contamination.
- Residential users of bedrock groundwater beneath the Facility property as a potable water supply would be exposed to risks which would exceed EPA risk goals because of VOC, PCB, and arsenic contamination.
- Risks to future residential users of off-facility shallow groundwater as a potable water supply would exceed EPA risk goals because of VOCs, PCBs, and metal contamination.

- Risks to future residential users of off-facility bedrock groundwater as a potable water supply would exceed EPA risk goals because of VOCs and metal contamination.

Soil:

- Exposure to on-facility surface soil by a future resident indicated a potential risk which would exceed EPA risk goals because of benzo[a]pyrene, PCB (Aroclor 1260), chromium, and manganese contamination.
- Exposure to on-facility surface and subsurface soil by a construction worker would result in non-cancer hazards that exceed EPA goals because of PCB (Aroclor 1254) contamination.
- Future residential risks to on-facility subsurface soil would exceed EPA risk goals because of benzo[a]pyrene, PCBs, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), and arsenic contamination.
- Future residential risks from exposure to off-facility surface soil would exceed EPA risk goals because of PCB (Aroclor 1254), chromium, and manganese contamination.
- Exposure of future construction workers off-facility boundary to a combination of surface and subsurface off-facility soil would result in non-cancer hazards that exceed EPA goals because of PCB (Aroclor 1254) contamination.
- Future residential risks from exposure to off-facility subsurface soil would exceed EPA risk goals because of PCB (Aroclor 1254), and manganese contamination.

Surface Water and Sediment:

- Incidental trespasser exposure to wetland surface water and sediment on the Facility. Only lead was of concern due to the potential for ingestion of the contaminated surface water and sediment.
- EPA conducted an independent evaluation of the potential human health risks from contact with Montour Run surface water. The results of the assessment concluded that ingestion and dermal contact with surface water and sediment in Montour Run did not pose an unacceptable risk or adverse health effect to a current or future recreational user.

7.1.5 Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources, including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Fate and transport modeling is also associated with a certain level of uncertainty. Factors such as the concentrations in the primary medium, rates of transport, ease of transport, and environmental fate all contribute to the inherent uncertainty in fate and transport modeling.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health and environmental risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the RI Report.

7.2 Summary of Ecological Risk Assessment

Two Screening Level Ecological Risk Assessments (SLERAs) were performed to identify the potential environmental risks associated with the Site. The initial SLERA concluded that there were potential risks associated with on-facility soils and with surface water and sediments in the Facility wetlands. The supplemental SLERA also identified potential risks to ecological receptors associated with surface soils located adjacent to the Facility along Montour Trail, and potential risks to ecological receptors due to COCs in shallow off-facility groundwater. PCBs detected in off-facility surface soils and in shallow off-facility groundwater samples drove the potential ecological risks noted in the SLERA. No further analysis was done in the RI.

7.3 Basis for Remedial Action

Based upon the quantitative human health risk assessment and the qualitative ecological evaluation, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health and the environment.

8.0 REMEDIAL ACTION OBJECTIVES (RAOs)

The RAOs provide a general description of what the Superfund cleanup is designed to accomplish. These goals serve as the design basis for the Selected Remedy identified in this ROD. Specifically, RAOs are specific goals developed to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs); standards, other federal or state advisories, criteria, or guidance (to be considered or "TBC"); and site-specific risk based concentrations (RBCs).

The following objectives were developed to protect human health and the environment from risks posed by the actual and threatened release of hazardous substances from the Site. The objectives are given for each media of concern:

Groundwater

- Restore the aquifer to beneficial use (achieve ARARs) in groundwater. Groundwater is restored and COCs levels are reduced to MCLs or non-zero MCLGs or applicable ACT 2 MSCs (see Table 22 in Appendix II), whichever is more stringent and, additionally, the cumulative risk from residual COCs will be reduced to an acceptable risk level (i.e., carcinogenic risk of 1E-6 to 1E-4 or less, and HI of 1 or less per target organ) in accordance with EPA risk assessment guidance. However, EPA will not require COCs to be reduced below background concentrations.
- Prevent residential use of contaminated groundwater (shallow and bedrock) until performance standards are achieved.
- Prevent or reduce further migration of contaminants in the groundwater (shallow and bedrock); monitor groundwater to ensure that migration does not occur and potable wells do not become contaminated, and contaminants are not released to Montour Run to prevent fish and wildlife exposure.
- Prevent the further migration of contaminated groundwater from the WMA located at the Facility.
- Reduce further leaching of contaminants from the contaminated soils to the groundwater.

Soils

In general, soils with concentrations of PCBs above the protective levels also have elevated levels of other COCs above the protective levels. This indicates co-location of the COCs in the soil; the aerial and vertical extent of PCB containing soils envelope the locations where surface and sub-surface soils contain other COCs above the protective levels. Therefore, PCBs were selected as a marker for the Site-related soil contamination cleanup.

EPA has determined that a total PCB concentration of 15 mg/kg is protective for on facility surface soils and 1.5 mg/kg is protective for off-facility soils. Therefore these PCB levels are

identified as the PCB action levels. These actions levels assume a residential receptor off-facility and an industrial receptor at the Facility.

- Prevent residential, construction-worker, and ecological receptor exposure to on-facility surface and subsurface soil, or remove soil that is above protective levels.
- Prevent residential, construction-worker, and ecological receptor exposure to off-facility surface and subsurface soil, or remove soil that is above protective levels.

Surface Water

- Prevent trespasser and wildlife exposure to lead contamination in wetlands located within the WMA.

9.0 DESCRIPTION OF ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment; be cost-effective; comply with ARARS; and utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under Federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

The FS in was completed in December 2006. In February 2007, the Work Group amended the FS to reduce the size of the WMA to encompass only the area used for buried waste. The FS discusses the full range of alternatives evaluated for the Site and provides supporting information relating to the alternatives in the proposed plan. Alternative 3 describes the selected remedy presented in the ROD.

9.1 Common Elements

The remedial alternatives presented in the proposed plan, except for the No Further Action alternative, contain the following elements in common: source removal, groundwater treatment, and Institutional Controls (ICs) to restrict the use of the Site and groundwater exceeding performance standards.

9.2 Description of Alternatives

The cost presented for each alternative will include capital costs, annual operation and maintenance (O&M) costs and the 30 year present worth cost calculated using a discount rate of 5%.

9.2.1 Alternative 1: No Action

Estimated Capital Costs	$0
Estimated Annual O&M Costs	$0
Estimated Present Worth Cost	$0

The No Action Alternative is considered in accordance with NCP requirements (§300.430(e)(6)) and provides a baseline for comparison with other alternatives. If this alternative was implemented, the current status of the Site would remain unchanged. The magnitude of the risks at the Site is likely to remain the same since contaminated soils and groundwater that poses a risk to human health will remain on-site. Institutional Controls would not be implemented to restrict future Site development or use. Engineering controls would not be implemented to prevent Site access or exposure to Site contaminants. This alternative would allow COCs at the Site to dissipate through natural attenuation and naturally occurring biodegradation. Because COCs would remain on-site, the 1986 CERCLA amendments require that the Site be evaluated every five years.

9.2.2 Alternative 2: Removal of Contaminated Soils, Backfill with Clean Soil, Removal of Floating and Collectible LNAPL, and Pumping and Treatment of Contaminated Groundwater

Estimated Capital Costs	$45,680,000
Estimated Annual O&M Costs	$140,000 - $210,000
Estimated Present Worth Cost	$69,000,000

This alternative includes removal of all contaminated soils. Implementation of this alternative would eliminate the possibility of further groundwater contamination because the contaminated soil source material would be removed.

This alternative would include the short term installation of a vertical barrier to control the limits of excavation and to manage the groundwater flow during the excavations.

The disposal of excavated soils would likely involve three types of facilities due to variation in the distribution of COCs. Disposal of excavated soils would likely occur at Toxic Substance Control Act (TSCA) facilities; RCRA treatment, storage, and disposal facilities (TSDFs); and at facilities that are capable of managing materials containing dioxin. Approximately 119,000 CY (140,000 tons) of material would be excavated and removed; it is assumed that 30% of this material would go to a TSCA facility, 10% to a RCRA facility, and the remainder to a facility permitted to receive dioxin-containing materials. Confirmation sampling would be performed to verify that the soils exceeding the performance standards have been removed. The excavated

areas would then be backfilled with clean fill imported from off-site, and the area would be regraded and revegetated as needed. Since the wetland located on the Facility would be eliminated and the storage capacity for flood waters reduced by the placement of soil cover, wetlands replacement is required under Section 404 of the Clean Water Act.

Groundwater containing COCs would be extracted until groundwater is restored and COCs levels are reduced to performance standards. This would be achieved by four newly installed extraction wells extended into bedrock. The extracted groundwater would be pumped to a treatment system constructed on the Facility. The system would include a number of treatment components assembled into a comprehensive treatment system. The treatment components would include an oil/water separator, sand filter, metals precipitation, air stripper with vapor phase carbon treatment if it is needed to meet PADEP emission standards, and a carbon polishing unit. Following treatment, the water would be discharged to Montour Run through a newly installed discharge pipe to meet NPDES discharge limits.

A long-term groundwater and surface water monitoring program would be implemented to evaluate the effectiveness of the remedy in meeting performance standards over time. It is anticipated that ten monitoring wells near the Facility and ten off-facility monitoring wells would be sampled and analyzed, along with two surface water sampling locations in Montour Run. The precise number of monitoring wells and the sampling frequency and duration would be determined during the Remedial Design (RD) and Remedial Action (RA) implementation. Additionally, two residential wells that are located downgradient from the Site and are currently being used for potable water supply will be monitored at an appropriate frequency to confirm that COCs are not migrating from the Site to these wells.

Fencing would be maintained and/or upgraded around the Facility to prevent vandalism. In addition, institutional control (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP) would be implemented in order to protect the remedy and prevent exposure to Site contaminants. The eventual goal is to restore groundwater to RAOs. In the meantime, the institutional controls will minimize potential human health risks by preventing exposure to impacted groundwater until it is restored to the performance standards.

9.2.3 Alternative 3: RCRA Modified Cap and Slurry Wall Containment System, Removal of Floating and Collectible LNAPL, Enhanced Monitored Bio-Attenuation of Contaminated Groundwater outside the WMA and Contingent Pump and/or Treat.

Estimated Capital Costs	$4,290,000
Estimated Annual O&M Costs	34,000 - $220,000
Estimated Present Worth Cost	$8,070,000

Estimated Present Worth Cost with Contingency 1, if needed	$11,650,000
Estimated Present Worth Cost with Contingency 1 & 2, if needed	$12,610,000

This alternative includes the identification of a WMA which will contain contaminated soils and groundwater with high concentrations of COCs through the construction of a slurry wall containment system and a RCRA modified cap. This alternative also includes the consolidation of contaminated on-facility surface (minimum two feet) soils exceeding performance standards outside of the WMA into the WMA and off-facility soils exceeding the performance standards will also be consolidated into the WMA. The alternative also includes recovery of floating and collectible LNAPL. Groundwater outside the WMA will be restored to performance standards through the use of enhanced bioattenuation, which does appear to be a viable option at the Site. Currently available groundwater data indicate that biodegradation has been occurring, in some cases to a significant extent, in spite of the presence of various metals.

The first major component of Alternative 3 is the installation of a RCRA modified cap with an impermeable membrane over the WMA (see figure 11). Prior to the installation of the cap, contaminated off-facility soils where PCB concentrations exceed 1.5 mg/kg would be excavated and consolidated under the cap at the WMA. On-facility surface soil (minimum 2 feet) located outside of the WMA with PCBs concentrations exceeding 15 mg/kg will also be excavated and consolidated into the WMA. Additionally, any soils located outside of the WMA above the groundwater table which contain COCs exceeding ACT 2 soil to groundwater MSCs and/or are stained with oil will be excavated and consolidated under the cap into the WMA. The installation of the cap over the WMA, will prevent direct contact with impacted soils, would greatly reduce the volume of infiltration through the soils and the leaching of contamination to the groundwater. Since the wetland is located within the WMA, it will be eliminated and the storage capacity for flood waters will be reduced by the cap, therefore wetlands replacement is required under Section 404 of the Clean Water Act. Replacement of wetland will be located on the facility and the exact location to be determined during the RD.

The floating and collectible LNAPL would be removed by an oil recovery system. For cost estimating purposes, it is anticipated that the recovery system would include the installation and operation of up to 10 recovery wells within the WMA that would use skimmer pumps to recover floating and collectible LNAPL. The RD will determine the precise numbers and locations of recovery wells. The recovered LNAPL would be disposed of off-site at an appropriate disposal facility.

The migration of COCs from the WMA in groundwater would be contained by the installation of an impermeable vertical slurry wall that would completely encircle the WMA and essentially "trap" the potentially impacted groundwater within the WMA boundaries. The slurry wall will be a 2 to 3-foot thick, approximately 40-foot deep cutoff wall keyed into the siltstone or shale

bedrock beneath the WMA. This will retard the lateral movement of groundwater into the WMA, and out of the WMA. The modified RCRA cap, combined with the slurry wall, would be expected to provide a long-term reduction in the water level within the WMA which is expected to produce inward and upward gradients for groundwater flow which will further reduce the potential for migration of COCs from the WMA. The effectiveness of the slurry wall, (i.e., its ability to minimize the inflow of groundwater on the upgradient side of the slurry wall and the seepage of contaminated groundwater from the downgradient side of the slurry wall) would be monitored using well clusters installed at six locations along the boundary of the WMA. Each cluster would consist of three monitoring wells. These wells would be monitored to evaluate the containment system's effectiveness in trapping the contaminated groundwater within the WMA.

A pre-design investigation for the slurry wall would be conducted for this alternative. Results of the investigation would be used to design the final slurry wall parameters such as depth, thickness and permeability. If the data indicates the conceptual design of the slurry wall would not be effective in controlling groundwater migration (especially in the bedrock aquifer), the depth of the slurry wall may be extended at some locations and/or the extraction of groundwater from inside the slurry wall containment would be required as a contingent remedy (see Contingency 1 below) to maintain the inward and upward gradients of the groundwater.

Contingency 1: Extraction and Treatment of Groundwater Within the WMA:

If it is determined, through the design of the RCRA modified cap and slurry wall containment system, that the groundwater within the WMA cannot be contained with the slurry wall alone, pumping of groundwater within the WMA will be needed to maintain inward and upward groundwater gradients to control the groundwater plume within the WMA. Groundwater elevations within the slurry wall are required to be lower than groundwater elevations outside and below the WMA to indicate an inward and upward gradient. If upward and inward gradients cannot be demonstrated and maintained during remedy implementation, then Contingency 1 will be instituted. The time frame for the demonstration of effectiveness of containment system cannot be ascertained at the time of the writing of this ROD, however, at the conclusion of design and pilot testing, some understanding would be developed. At that time, EPA, in consultation with PADEP, will determine the time frame and the requirements of the inward/upward gradient to prove the effectiveness of the containment system.

Groundwater Treatment Outside the WMA

The groundwater contamination which exceeds performance standards outside the WMA would be addressed by enhancing the ongoing natural bioattenuation that is believed to be occurring. Nutrients would be injected into the groundwater outside the WMA following construction of the WMA to accelerate the natural bioattenuation process. VOCs act as a carrier for metals and PCBs. Reduction in VOC levels would be expected to reduce the mobility of metals and PCBs in groundwater and reduce further migration of contaminated groundwater downgradient. A pilot study will be conducted during the RD to determine if the use of monitored enhanced bioattenuation would be effective in reducing the COCs present in groundwater outside the

WMA. If the RD pilot study shows enhanced bioattenuation significantly increases natural attenuation levels, groundwater outside of the WMA will be treated *in situ* (evaluation of initial rate of reduction in COCs during the pilot study would generate a more accurate estimate of the time frame to achieve the desired cleanup). Groundwater monitoring will be performed to measure electron donor distribution, redox conditions, bacteria growth, and contaminant degradation. In addition, monitoring of groundwater quality in the sentinel wells will be used to verify that the remedy is preventing the spread of contamination. Enhanced bioattenuation may be concluded to be ineffective, and the contingency (see Contingency 2 below) of using a groundwater extraction system for groundwater treatment outside the WMA may be recommended if certain conditions arise. These include:

- The RD analysis concludes that enhanced bioattentuation would not be effective in achieving aquifer restoration within a reasonable time frame.

- The RD analysis indicates that the end products of the enhanced bioattentuation are harmful to human health or could negatively impact Montour Run.

- The slurry wall RD indicates that the migration of COCs from the WMA cannot be adequately controlled by the cap and slurry wall containment system and by implementation of contingency 1.

- The remedial action monitoring indicates that the cap and slurry wall containment system with contingency 1 is not effective in controlling the migration of COCs from the WMA.

- The Remedial Action monitoring indicates that enhanced bioattentuation is not effective in reducing concentrations of contaminants to performance standards. The progress of effectiveness will be evaluated every year by monitoring enhanced bioattentuation end results parameters that will be set during the RD.

If, within five years from the date of this ROD, performance standards have not been met nor successfully demonstrated that they will be met using enhanced bioattentuation technology in evaluating the conditions above, EPA will decide whether to implement Contingency 2.

Contingency 2: Extraction and Treatment of Groundwater Outside the WMA:

If it is determined that the cleanup approach (enhanced bioattenuation) for groundwater outside the WMA presented in this alternative is not effective in meeting the performance standards, then a contingency for the extraction and treatment of contaminated groundwater outside the WMA to restore the aquifer to beneficial use would be implemented. The groundwater would then be treated to remove contaminants prior to discharge to Montour Run in order to meet NPDES discharge limits.

Fencing would be maintained and/or upgraded around the Facility to prevent vandalism. In addition, ICs, such as title notices and land use restrictions through easements and covenants and

orders from or agreements with EPA and/or PADEP, would be implemented in order to protect the remedy and to prevent exposure to Site contaminants. With the implementation of the RCRA modified cap and slurry wall containment systems the ongoing releases of groundwater will be controlled, consequently the concentrations of VOCs, metals, and PCBs outside the WMA will decrease through natural attenuation. In addition, the *in situ* treatment of groundwater outside the WMA will accelerate the rate of decrease in VOC concentrations by enhancing the natural bioattenuation. The eventual goal is to restore groundwater to performance standards. In the meantime, the institutional controls will minimize potential human health risks by preventing exposure to impacted groundwater.

It is anticipated that 18 monitoring wells near the WMA and ten monitoring wells downgradient of the WMA would be sampled and analyzed quarterly, along with two surface water sampling locations in Montour Run. The precise number of monitoring wells and the sampling frequency and duration would be determined during the RD/RA implementation. Additionally, two residential wells located downgradient from the Site are currently being used for potable water supply and will be monitored at an appropriate frequency to confirm that the COCs are not migrating from the Site to these wells. The Site would need to be evaluated every five years because waste would remain in place at the Site.

9.2.4 Alternative 4: RCRA Modified Cap and Slurry Wall Containment System, Removal of Floating and Collectible LNAPL, and Pumping and Treatment of Groundwater within the WMA and Enhanced Monitored Bio-Attenuation of Groundwater Outside the WMA with Contingent Pump and Treat.

Estimated Capital Costs	$5,390,000
Estimated Annual O&M Costs	$128,000 - $296,000
Estimated Present Worth Cost	$11,650,000
Estimated Present Worth Cost with Contingency, if needed	$12,610,000

Alternative 4 is identical to Alternative 3 except that it requires extraction of groundwater within the WMA (Alternative 3 with Contingency 1) to induce inward and upward groundwater gradient within the WMA. If enhanced bioattenuation is determined to be ineffective on groundwater outside the WMA as explained in Alternative 3, Contingency 2 will be implemented. This alternative was evaluated in order to compare cost differences with Alternative 3, which does not have extraction of groundwater from the WMA to maintain the induced inward and upward gradients. The cost of implementing Alternative 4 is $3,580,000 higher than the cost of implementing Alternative 3 (without the contingencies). Similarly, the low end of the annual O&M (years 6 to 30) costs associated with Alternative 4 are significantly higher than that of Alternative 3 due to the operation and maintenance of the pump and treat system. For the alternative 3, if the contingency 1 is not implemented, the low end of the annual

O&M cost (years 6 to 30) drop off to approximately $34,000 because there are no annual O&M costs associated with pump and treat.

9.2.5 Alternative 5: Soil Cover with Funnel and Gate of Groundwater Using Reactive Wall and Floating and Collectible LNAPL Removal at the Site, with Enhanced Monitored Bio-Attenuation of Off-facility Groundwater

Estimated Capital Costs	$3,000,000
Estimated Annual O&M Costs	$30,000 - $140,000
Estimated Present Worth Cost	$7,080,000
Estimated Present Worth Cost with Contingency, if needed	$10,800,000

This alternative incorporates partial containment of contaminated on-facility soils along with *in situ* treatment of on-facility and off-facility groundwater containing COCs. Floating and collectible LNAPL recovery is also included. The major remedial components of the alternative are discussed below.

The impacted off-facility soils would be excavated and consolidated at the Facility prior to the installation of a two-foot thick soil cover. In Alternative 5, a soil cover would be used instead of a RCRA-modified cap because the *in situ* treatment, described below, would be enhanced by infiltration through the soil cover to promote flushing of the COCs from the soils at the Facility.

Since the wetland located on the Facility will be eliminated and the storage capacity for flood waters reduced by the placement of the soil cover, wetlands replacement is required under Section 404 of the Clean Water Act.

The *in situ* treatment process utilized in this alternative consists of a "funnel and gate" system. A soil-bentonite slurry wall would be installed approximately 40 feet deep into bedrock on the southern and western sides of the Facility and would serve as the "funnel." The slurry wall would direct groundwater flow to the "gate" which would be a permeable subsurface reactive wall constructed of iron filings. As the water flows through the reactive wall, the COCs would be treated chemically and removed from the water. Any residual COCs in the water would be addressed by enhanced bioattenuation. As with Alternatives 2 through 4, a product recovery system would be installed to remove floating and collectible LNAPL from below the Facility.

The VOCs in the groundwater migrating south along the path of Montour Run outside the Funnel and Gate System would be addressed by enhancing the ongoing bioattenuation that is occurring. Nutrients would be injected into the off-facility groundwater following installation of the Facility funnel and gate containment system to accelerate the bioattenuation process. VOCs act as a carrier for metals and PCBs. Reduction in VOC levels would be expected to reduce the mobility of metals and PCBs in groundwater and reduce further migration downgradient. The use of

enhanced bioattenuation would be evaluated throughout the Remedial Design and Remedial Action phases. Enhanced bioattenuation may be concluded to be ineffective, and the contingency of using a groundwater extraction system for off-facility groundwater similar to the systems proposed in Alternatives 3 and 4 may be recommended if certain conditions arise. These include:

- The RD analyses concludes that enhanced bioattentuation would not be effective in achieving aquifer restoration within a reasonable time frame (the reasonable time frame is difficult to ascertain for any groundwater cleanup technology); evaluation of initial rates of reduction in concentrations would generate some estimate of the time frame to achieve the desired cleanup.

- The slurry wall RD indicates that the migration of COCs from the Funnel and Gate System would not be adequately controlled by a slurry wall;

- Remedial Action monitoring indicates that enhanced bioattentuation would not be effective;

- The RD analysis indicates that the end products of the enhanced bioattentuation are harmful to human health or could negatively impact Montour Run.

- The Remedial Action monitoring indicates that enhanced bioattentuation is not effective in reducing concentrations of contaminants to performance standards. The progress of effectiveness will be evaluated every year by monitoring bioattenuation end results parameters that will be set during the RD.

A pre-design investigation for the slurry wall would be conducted for the alternative. Results of the investigation would be used to select the final slurry wall depth and to evaluate the slurry wall's effectiveness in controlling contaminant migration in the groundwater in the bedrock. If the data indicates the conceptual design of the slurry wall would not be effective in controlling COCs migration, the depth of the slurry wall may be extended at some locations or an off-facility pump and treatment system for groundwater may be installed rather than the use of monitored enhanced bioattenuation.

It is anticipated that 12 monitoring wells near the perimeter of the Facility and 10 monitoring wells downgradient of the Facility would be sampled and analyzed quarterly, along with two surface water sampling locations in Montour Run. The precise number of monitoring wells and the sampling frequency and duration would be determined during the RD and Remedial Action implementation. The Site would need to be evaluated every five years because COCs would remain on-site.

Fencing would be maintained and/or upgraded around the Facility to prevent vandalism. In addition, ICs, such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP, would be implemented in order to protect

the remedy and prevent exposure to Site contaminants. With the removal and relocation of impacted soils and source controls in place at the Facility to eliminate ongoing releases to groundwater, the concentrations of VOCs, metals and PCBs will decrease through natural attenuation outside the WMA. The *in situ* treatment of groundwater downgradient of the Facility outside the Funnel and Gate System will accelerate the rate of decrease in VOC concentrations by enhancing the natural bioattenuation. The eventual goal is to restore groundwater to performance standards. In the meantime, the institutional controls will minimize potential human health risks by preventing exposure to impacted off-facility groundwater.

10.0 COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considers the factors set out in Section 121 of CERCLA, 42 U.S.C. §9261, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR §300.430(e) (9) and Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01. The detailed analysis consists of an assessment of the alternatives against each of nine evaluation criteria and comparative analysis focusing upon the relative performance of each alternative against those criteria.

Threshold Criteria - The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.

10.1 Overall Protection of Human Health and the Environment

This criterion addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Each alternative presented in this ROD except the "No Action" alternative (Alternative 1) would provide adequate protection of human health and the environment by eliminating, reducing, or controlling risk through treatment, engineering controls, and/or institutional controls. Alternatives 2, 3, and 4 are more protective than Alternatives 5 because the leaching of contaminants from soil to groundwater will be eliminated. Alternatives 2 through 5 provide for collection and disposal of floating and collectible LNAPL from the Facility. LNAPL is the only identified "principal threat" noted to exist at the Site.

Alternative 2, which involves the removal of all on-site source materials, is somewhat more protective than other alternatives because of excavation and off-site disposal of all the waste, resulting is less leaching of contaminants. It will require fewer restrictions because all material is removed.

Alternatives 3, 4, and 5 are protective of human health and the environment because they prevent contact with soils, sediments, and surface water that drive potential risk concerns, and remove

the LNAPL principal threat waste from the Site. Protection from soils is achieved through excavation of contaminated soils outside the WMA and consolidation within the WMA under a cap or a soil cover. These alternatives are also protective because they control the migration of contaminated groundwater, and treat the COCs in groundwater. However, perpetual cap maintenance would be required to ensure total protectiveness. Alternatives 2 thorough 5 provide protection from contaminated groundwater through enforcement of ICs until the performance standards for groundwater are achieved. The potential ecological risks associated with the PCBs in the shallow off-facility groundwater would be addressed by natural attenuation once the source materials for groundwater contamination are either excavated with off-site disposal or the consolidated and encapsulated. The volume of COCs on-site is reduced by the LNAPL recovery system.

10.2 Compliance with ARARs

Any cleanup alternative considered by EPA must comply with all applicable or relevant and appropriate Federal and state environmental requirements. Section 121(d) of CERCLA and NCP §300.430(f)(1)(ii)(B) require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under CERCLA Section 121(d)(4).

Applicable requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, a pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only the state standards that are identified by a state in a timely manner and that are more stringent than Federal requirements may be applicable. Relevant and appropriate requirements are those clean-up standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than Federal requirements may be relevant and appropriate.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of Federal and State environmental statutes or provides a basis for invoking a waiver.

All of the alternatives, with the exception of Alternative 1, are designed to comply with ARARs. Alternative 2 would meet soil ACT 2 standards because contaminated soil would be excavated and disposed off-site. Alternatives 2 through 5 have a provision for restoration of groundwater COCs concentrations to MCLs or non-zero MCLGs, or MSCs whichever is more stringent.

For Alternatives 3 and 4, a modified RCRA cap is required to prevent direct contact with contaminated soil and reduce water infiltration through contaminated soils. This cap would also be designed to minimize flood impacts. Since the wetland located within the WMA would be eliminated because of construction of a cap or a soil cover (alternative 3,4&5), wetland replacement is required. Since RCRA and/or TSCA wastes are left in place within the WMA, a RCRA cap (cap with equivalent performance such as a multiplayer cap) is required to cover the WMA.

Alternatives 2 through 5 have a provision for restoration of groundwater COCs to MCLs or non-zero MCLGs or applicable ACT 2 Medium Specific Concentrations (MSCs), whichever is more stringent and, additionally, the cumulative risk from residual COCs will be reduced to an acceptable risk level (i.e., carcinogenic risk of 1E-6 to 1E-4 or less, and HI of 1 or less per target organ) in accordance with EPA risk assessment guidance. The area of attainment for alternative 2 is larger and is likely to require much longer cleanup because of the higher levels of contaminants at the Facility. Also, Alternative 5 would take more time to meet ARARs for the Facility groundwater due to inherent slow process of cleaning up contaminated groundwater within the Funnel and Gate System. Alternative 5's reactive wall (funnel) also has a potential to fail over time. Alternatives 3 and 4 also meet ARARs within the groundwater area of attainment. (For these alternatives, the groundwater area of attainment is outside of the WMA). Under Alternatives 3 and 4, groundwater cleanup is expected to be faster as the leaching of contaminants from the WMA will be considerably reduced as the contaminants in soil and groundwater will be trapped within the WMA.

Primary Balancing Criteria - The next five criteria, criteria 3 through 7, are known as "primary balancing criteria." These criteria are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given the site-specific data and conditions.

10.3 Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once performance standards have been met. This criterion includes the consideration of magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes that will remain on-site following remediation.

Alternative 2 has increased long-term effectiveness because of the excavation and off-site disposal of the waste and soils from the Site. Alternatives 5 would require intensive periodic maintenance of the reactive wall to maintain effectiveness and thus has reduced permanence. Because Alternatives 3 & 4 do not use a reactive wall, they both have higher long-term effectiveness than alternative 5 but less than alternative 2. Alternative 3 & 4 can also be easily maintained.

10.4 Reduction of the Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment

Reduction of toxicity, mobility, or volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy.

Alternative 1 does not include treatment as a component of the remedy. Therefore, this alternative would not reduce the toxicity, mobility, or volume of contamination at the Site, except that which would happen through natural attenuation. Alternatives 2 through 5 remove the principal threat waste and use a combination of treatment and containment. Alternative 2 additionally involves the complete removal of contaminated soils with levels of COCs above action levels and LNAPLs. Alternatives 3, 4 and 5 reduce the toxicity of contaminants by enhancing natural bioattenuation in groundwater outside the WMA (for Alternative 5 outside the Facility). Alternative 5 additionally reduces the volume of contaminated groundwater within the WMA by funneling it through a vertical reactive wall, Alternatives 3 and 4 also prevent migration of contaminants from the WMA by containing and maintaining inward and upward groundwater gradient.

10.5 Short-Term Effectiveness

Short-term effectiveness addresses the period of time needed to implement the remedy and achieve protection, as well as any adverse impacts that may be posed to workers, the community, and the environment during construction and operation of the remedy until the performance standards are achieved.

Alternative 1 has the highest level of short-term effectiveness because no actions are performed that could lead to exposure to the community or workers. Additionally, since no remedial actions are planned, Alternative 1 can be implemented in a very short period of time. Alternative 2 has the lowest level of short-term effectiveness because the excavation and off-site disposal of impacted media have the potential to expose the community and construction workers to COCs. Additionally, Alternative 2 will take a significant amount of time to implement. The remaining alternatives have higher short-term effectiveness, as less potentially hazardous material is transported through the community during construction. With proper engineering controls, short term effectiveness of Alternatives 2 through 5 can be easily achieved. Alternatives 3 and 4 would control the migration of contaminated groundwater from the WMA as soon as they are implemented. There will be limited risks associated with the materials containing COCs that will be brought to the surface during installation of the slurry wall under Alternatives 3, 4, and 5.

10.6 Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

The implementability of Alternative 1 is high because no remedial actions are conducted. Alternative 2 uses established, commonly used technologies, however, Alternative 2 will have some difficulties in its implementation because of the potential concerns related to the off-site disposal of media contaminated with dioxins and furans. The implementability of Alternatives 3, 4, and 5 is somewhat complex due to the construction of vertical slurry walls and the need for a pilot study to confirm the effectiveness of enhanced bioattenuation.

10.7 Cost

Cost includes estimated capital and O&M costs, and net present worth value of capital and O&M costs. The table below presents a comparative cost summary of the alternatives discussed in this Record of Decision.

Remedial Alternatives Cost Summary			
Alternative Number	Capital Cost ($)	Annual O&M Cost ($)	Present Worth ($)
1	0	0	0
2	45,680,000	140,000-210,000	69,000,000
3	4,290,000	30,000-220,000	8,070,000
3 (with Contingency 1)			11,650,000
3 (with Contingency 1& 2)*			12,610,000
4	5,390,000	128,000-296,000	11,650,000
4 (with Contingency 2)			12,610,000
5	3,000,000	30,000-140,000	7.080,000
5 (with contingency 2)			10,800,000

*Cost for Alternative 3 (with Contingency 1 & 2) is equal to Alternative 4 (with Contingency 2)

No cost is associated with Alternative 1, however, it is not protective of human health or the environment nor does it comply with ARARs. Alternative 2 costs approximately 6 times more than the other alternatives. The major cost associated with Alternative 2 is the cost of disposal of contaminated soils to off-site locations. The potential variability of costs associated with Alternatives 2 is also high due to uncertainty regarding the volumes under specific disposal conditions (e.g., dioxin-containing, TSCA, RCRA-hazardous, or residual wastes). O&M costs under Alternative 2 are primarily driven by the pump and treat system. The costs of Alternatives 3, 4, and 5 are generally similar, and are in the range of $7,080,000 to $11,650,000. Alternatives 3 and 4 both meet the Remedial Action Objectives, however, Alternative 3 is less costly than 4, unless the Contingency 1 remedy is implemented, in which case the costs are similar. Similarly, the low end of the annual O&M (years 6 to 30) costs associated with Alternative 4 are significantly higher than that of Alternative 3 due to the operation and maintenance of the pump

and treat system. For the alternative 3, if the contingency 1 is not implemented, the low end of the annual O&M cost (years 6 to 30) drop off to approximately $34,000 because there are no annual O&M costs associated with pump and treat.

Alternative 5 is the least costly of the alternatives where action is taken, however, it is only somewhat protective of human health and the environment, may be difficult to implement, relatively slow to achieve performance standards, and has a potential for the reactive wall failure.

Modifying Criteria - The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred remedy and cause another response measure to be considered.

10.8 State Support/ Agency Acceptance

State support/agency acceptance indicates whether, based on its review of the RI/FS reports and the Proposed Plan, the state supports, opposes, and/or has identified any reservations with the selected response measure. The PADEP has expressed support for alternative 3.

10.9 Community Acceptance

Community Acceptance summarizes the public's general response to the proposed alternative and other information described in the Proposed Plan and the RI/FS reports. This assessment includes determining which of the response measures the community supports, opposes, and/or has reservations about.

During the public comment period, the community expressed its support for Alternative 3. The attached Responsiveness Summary presents the community's comments and EPA responses regarding the Proposed Plan.

11.0 PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Conversely, non-principal threat wastes are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure. Contaminated groundwater generally is not considered to be a "source material" and, therefore, not a principal threat. The manner in which principal threats are addressed generally will determine whether the statutory preference for treatment as a principal element is satisfied.

At the Breslube-Penn Site, the LNAPL identified previously in this ROD is a source material that meets the definition of a principal threat waste. In addition, the concentrations of PCBs in the LNAPL exceed 500 ppm, which is the threshold specified in EPA's *Guidance for Remedial Actions at Superfund Sites with PCB Contamination*, for a principal threat PCB waste. EPA's expectation for site remediation is that treatment will be used wherever practicable to address principal threat wastes. As a result, and consistent with EPA guidance, the Remedial Action Objective for the LNAPL as a principal threat waste is to reduce the quantity of free-phase LNAPL and any associated oil-water emulsion to the extent practicable and provide containment for any residual LNAPL that cannot be removed from the surface.

12.0 SELECTED REMEDY

Based upon consideration of the results of the Site investigation, the requirements of CERCLA, the detailed analysis of the response measures, and public comments, EPA and the State of Pennsylvania have determined that *Alternative 3 - RCRA Modified Cap and a Slurry Wall Containment System, Removal of LNAPL, and Enhanced Bio-Attenuation of Groundwater Outside the WMA and Contingent Pump and Treat*, is the appropriate remedy for addressing the contaminants at the Site. This alternative meets the threshold criterion of overall protection of human health and the environmental and complies with applicable or relevant and appropriate requirements. In considering the balancing criteria, EPA believes that this alternative can be readily implemented, can achieve long-term effectiveness and permanence at a reasonable cost, will result in minimal short-term impacts, and will effectively reduce the toxicity, mobility, and volume of the groundwater contaminants by removing the LNAPL source and enhancing the natural bioattenuation of contaminated groundwater outside the WMA.

12.1 Summary of the Rationale for the Selected Remedy

EPA has determined that Alternative 3, the Selected Remedy, is protective of human health and the environment and complies with ARARs. Alternative 2 is also protective; however, it is cost prohibitive. Alternatives 3, 4, and 5 are protective of human health and the environment because they prevent contact with surface soils, sediments, and surface water that drive potential risk concerns, and remove the LNAPL principal threat waste from the WMA. Alternatives 3 and 4 are further protective because they control the migration of COCs from the WMA, and treat the COCs in groundwater outside the WMA. The potential human health and ecological risks associated with off-facility soils will be mitigated under Alternatives 3, 4, and 5 by their excavation and consolidation within the WMA (Alternatives 3 and 4) or on the Facility for the Alternative 5. The long-term effectiveness of Alternative 5 may be questionable due to possible concerns that the reactive wall may, after a specific period of performing satisfactorily, eventually begin to fail to adequately treat the organic compounds that are discharging with groundwater through the reactive wall. Consideration was given to Alternatives 3 and 4, which both meet the Remedial Action Objectives. However, Alternative 3 was selected because it is less (approximately 25% less) costly than 4, unless Contingency remedy 1 is implemented, in which case the remedies and costs are similar.

The primary goals of this remedy are to (1) reduce the potential for direct contact with impacted soils by creating a physical barrier between the soils and potential receptors; (2) removal of the LNAPL from the WMA with off-site treatment and disposal; (3) prevent the migration of groundwater containing COCs from the WMA; and (4) reduce the migration of COCs in groundwater outside the WMA by treating groundwater in situ prior to it migrating to locations where it can be ingested as drinking water; and (5) restore the aquifer to its beneficial use as a drinking water supply.

12.2 Description and Performance Standards for Selected Remedy

The Selected Remedy (Alternative 3) identifies an area on the Facility as "a Waste Management Area" for purposes of attaining remediation levels. The WMA essentially encompasses the area that was used as the processing area in the past and where the principal threat LNAPL is located. (See Figures 11 and 12) The preamble to the NCP provides that remediation levels should be attained at and beyond the edge of a WMA where waste is left in place, 55 Fed. Reg. 8753 (Mar. 8, 1990).

Performance Standards for each component of Alternative 3 have been developed to address the unacceptable risk posed by the Site and to comply with ARARs. The following are Performance Standards for the key components of the Selected Remedy.

Waste Management Area Containment System

Slurry Wall

A slurry wall will be designed and constructed to completely encircle the WMA and essentially "trap" the potentially impacted groundwater below the Facility boundaries. The slurry wall shall be constructed to be approximately a 2 to 3 foot thick, 40 foot deep cutoff wall that is keyed into the siltstone or shale bedrock beneath the WMA to a minimum depth of 2 to 5 feet. The final depth and thickness of the slurry wall will be selected during the remedial design. The primary goal of the slurry wall is to prevent/minimize the migration of the COCs in groundwater in both unconsolidated materials and bedrock located within the WMA to areas outside the slurry wall. The slurry wall material shall be constructed of a material with a permeability of 1×10^{-7} cm/sec or less to minimize lateral migration of groundwater from the WMA. It is anticipated that test borings will be installed during remedial design to select the final design parameters for the slurry wall.

Soils

Prior to the installation of the RCRA-modified cap, contaminated off-facility soils, above the water table, with PCB levels above 1.5 mg/kg (residential cleanup levels) shall be excavated and consolidated in the WMA. On-facility soils outside the WMA, above the water table, which contain PCBs concentrations above 15 mg/kg (industrial cleanup levels) shall be excavated to a depth of at least 2 feet and consolidated into the WMA. The selection of industrial cleanup

levels for on-facility soil relies on the fact that the facility owner, as a defendant, must restrict the facility use as designated by EPA. As such, EPA can enforce that the designated use of the facility will remain unchanged and consistent with EPA's remedial action objectives. Such restrictions (such as institutional controls limiting the facility to industrial use) are necessary due to the soil COCs located on-facility over residential risk levels. However, the selection of residential cleanup levels for off-facility soils relate to EPA's inability to control the zoning or deed restrictions of adjacent properties owned by third party non defendants, who, despite their current voluntary restrictions, can at any time, and for any reason, change these restrictions without notice to or approval by EPA. Additionally, any soils located outside the WMA and above the groundwater table which contain COCs that exceed ACT 2 soil to groundwater MSCs and/or are visually stained with LNAPL shall be excavated and consolidated into the WMA. Confirmative soil samples from the excavated area shall be collected and analyzed to confirm that no COCs are present above the performance standards in Table 22.

RCRA-Modified Cap

Upon completion of all soil consolidation activities, a RCRA-modified cap shall be placed over the WMA. The cap shall be designed to meet the requirements of a RCRA cap, including a base layer to support other layers, a low permeability layer of 1 x 10 -7 cm/sec, a drainage layer, and a final soil cover including a vegetative layer.

Containment System Effectiveness

The effectiveness of the slurry wall/cap containment system will be monitored using well clusters installed at approximately six locations along the perimeter of the WMA. Each cluster will have approximately three monitoring wells. One well in each cluster shall be installed to a depth of about 20 feet inside the slurry wall. The other two wells will be located outside of the slurry wall and will be installed to depths of about 20 feet and 50 feet. These wells will be monitored for both water levels and groundwater chemistry to evaluate the containment system's effectiveness. Groundwater elevations within the slurry wall are required to be lower than groundwater elevations outside and below the slurry wall to indicate an inward and upward gradient. If it is determined during the RD and/or RA stage that contaminated groundwater within the WMA cannot be contained, then Contingency 1: Extraction and Treatment of Groundwater within the WMA will be implemented to capture and contain the impacted groundwater within the WMA.

LNAPL Collection System

An LNAPL collection system shall be constructed within the WMA. The collection system shall be designed to capture and remove LNAPL from the surface of the groundwater. The collected LNAPL will be disposed off-site at an appropriate disposal facility. The collection system will be operated until all collectable LNAPL as been removed and confirmed by analysis. Once it is confirmed that LNAPL is no longer present, the recovery wells shall be sampled for twelve

consecutive quarters and if the LNAPL is not observed in these wells, the operation of the recovery system shall be discontinued.

For cost estimating purposes, it has been assumed that the LNAPL collection system will include the installation and operation of 10 recovery wells within the WMA that will use skimmer pumps to recover LNAPL. The precise number of extraction points and the details of the LNAPL recovery system will be determined during pilot studies that will be conducted during the RD and RA implementation.

Groundwater Remediation Outside the WMA

Groundwater will be remediated in impacted areas outside the slurry wall by the use of in situ enhanced bioattenuation. The concentrations of contaminants in groundwater outside the WMA are expected to attenuate and decrease over time after injection of bioattenuation agents is initiated. Enhanced bioattenuation will continue until all impacted groundwater is restored to MCLs and/or MCLGs or ACT 2 MSCs whichever is more stringent and residual cumulative health risk is reduced to 1E-6 to 10E-4 health-based risk levels. Table 22 presents specific performance standards for COCs at the Site.

Enhanced Bioattenuation

The RD shall include an Enhanced Bioattenuation Pilot Study to optimize the locations, frequency, and dosages for bio-reagent injections designed to effect the enhanced bioattenuation treatment. During the Pilot Study, additional sampling and analysis will be performed to confirm effectiveness of the enhanced bioattentuation, the rate at which enhanced bioattentuation is occurring, and what methods should be used to achieve the objective of this action to accelerate the process. Upon completion of the Pilot Study, an Enhanced Bioattenuation Plan shall be submitted to EPA for approval. The Plan shall include the number of injection points and reagents to be used. The injection points will be designed to allow injection of reagents into the unconsolidated materials and upper bedrock zones. Upon EPA approval of the Enhanced Bioattenuation Plan, the full scale technology shall be implemented.

Groundwater monitoring shall be performed to measure electron donor distribution, redox conditions, bacteria growth, and contaminant degradation. An annual report containing monitoring results and analysis will be required.

Based on an evaluation of groundwater data during design or implementation of enhanced bioattenuation, the need to institute Contingency 2: Extraction and Treatment of Groundwater outside the WMA will be implemented if the following conditions arise:

- The Pilot Study concludes that enhanced bioattentuation would not be effective in achieving aquifer restoration within a reasonable time frame.

- The Pilot Study indicates that the end products of the enhanced bioattentuation are harmful to human health or could negatively impact Montour Run.

- The Remedial Action monitoring indicates that enhanced bioattentuation is not effective in reducing concentrations of contaminants to performance standards. The progress of effectiveness will be evaluated every year by monitoring enhanced bioattentuation end results parameters that will be set during the RD.

If, within five years from the date of this ROD, performance standards have not been met nor successfully demonstrated that they will be met using enhanced bioattentuation technology in evaluating the conditions above, EPA will decide whether to implement Contingency 2.

Contingent Groundwater Extraction System

The components described below will only be used if the enhanced bioattenuation is determined to not be as effective as outlined above. A groundwater extraction system shall be designed and constructed to effectively remediate groundwater. Multiple extraction wells to create a capture zone that will fully contain and remediate the impacted groundwater. The specific details of the extraction system including the number and exact location of extraction wells and collection trenches and pumping rates shall be determined during the Remedial Design, if warranted, and shall be approved by EPA in consultation with PADEP.

The groundwater remediation system shall be operated and maintained until all impacted groundwater is restored to MCLs and/or MCLGs or ACT 2 MSCs whichever is more stringent and residual cumulative health risk is reduced 1E-6 to 10E-4 health-based risk levels. Table 22 presents specific performance standards for COCs at the Site.

Long-term monitoring of the groundwater treatment system is outlined below. Once the performance standards are reached throughout the plume, monitoring wells shall be sampled for twelve consecutive quarters. If contaminant levels remain below the performance standards, the operation of the extraction system shall be discontinued. Semi-annual monitoring of the groundwater shall continue for a minimum of five years. If, subsequent to extraction system shutdown, monitoring shows the groundwater concentrations of any contaminant of concern to exceed the cleanup criteria, the system shall be restarted and continued until the contaminant levels throughout the plume have been attained again for twelve consecutive quarters. Annual monitoring shall continue until EPA determines, in consultation with PADEP, that contaminants have stabilized below the cleanup criteria.

Metals Removal

The groundwater collected by the extraction system may require metals removal, such as sand filtration, metals precipitation and sludge dewatering. Components of the metals treatment system shall be determined during the Remedial Design and shall be approved by EPA in consultation with PADEP prior to implementation.

Air Stripper

The groundwater collected by the extraction system shall be treated using an air stripper and or active carbon beds. Air and water flow rates as well as other design specifications shall be determined during the Remedial Design and shall be approved by EPA in consultation with PADEP prior to implementation. The need for ultra violet groundwater treatment to address PCBs will also be determined during the RD.

Off-Gas Treatment

As the contaminants are transferred in the stripping and or carbon units from the aqueous-phase to the vapor-phase, off-gas treatment, consisting of carbon adsorption, may be required to satisfy the Clean Air Act, the Pennsylvania Air Quality Control Regulations, and other ARARs listed in the Statutory Determinations section. The spent carbon shall be treated and disposed off-site at an approved RCRA facility.

Effluent Discharge

The treated water from the stripping unit shall be discharged into the Montour Run or used as a non-potable supply. The exact point of discharge or use and related design criteria shall be determined during the Remedial Design and shall be approved by EPA, in consultation with PADEP, prior to implementation. The treated effluent discharge shall comply with the substantive requirements of an NPDES permit and EPA ambient water quality criteria.

Quality Control Monitoring

Quality control monitoring shall be performed to evaluate the effectiveness of the groundwater extraction and treatment system. The frequency and nature of quality control monitoring shall be determined during the Remedial Design and shall be approved by EPA in consultation with PADEP prior to implementation.

Area of Attainment

The area of attainment for the groundwater remediation is defined as the extent of groundwater contamination beyond the boundary of the WMA which exceeds MCLs and/or MCLGs or ACT 2 MSCs or 1E-6 health-based risk levels (contaminant plume see figure 10).

Monitoring of Cleanup

Long-term monitoring of groundwater and surface water shall be implemented to evaluate the effectiveness of the remedy and the enhanced bioattenuation of COCs. A system of monitoring wells shall be designed and installed to monitor the cleanup progress throughout the area of attainment (plume). The number and location of these monitoring wells shall be approved by

EPA in consultation with PADEP during the remedial design. In the initial years the well samples shall be analyzed for all the COCs. Based upon these initial samples, the list of COCs that need to be analyzed can be reduced to those COCs detected above performance standards. However, when it is believed that the active remediation of the contaminated groundwater achieves performance standards, the groundwater samples shall be analyzed for all the COCs as follows: the frequency of sampling shall be quarterly for the first two years, semi-annually for the next two years, and annually thereafter until the levels of COCs in these wells have reached the performance standards.

Annual Year Review

An annual evaluation of the groundwater monitoring data shall be conducted after the remedy is implemented to assure that the remedy continues to protect human health and the environment and progressing as envisioned in the RD. Submittal of an Annual Groundwater Monitoring Report with an evaluation of the enhanced bioattentuation shall continue until it is replaced with a different frequency by EPA.

Erosion Control

Prior to commencement of excavation or soil disturbance work, an erosion and remediation control plan shall be developed and implemented to address control measures for all activities that potentially transport soil or sediment. The plan shall be developed in accordance with PADEP and local regulations and shall be approved by EPA in consultation with PADEP prior to implementation. Since the Site is located in the 100 years floodplain, to prevent damage to the RCRA modified cap WMA during potential flooding event, additional woody vegetation shall be planted on the upgradient perimeter of the WMA.

Confirmation Sampling during Excavation of Soil and Sediment

During excavation of contaminated soil and sediment, confirmatory sampling shall be conducted in a representative manner to ensure that all performance standards have been met. The protocol for sampling and analysis shall be developed during the Remedial Design and must be approved by EPA in consultation with PADEP prior to implementation.

Wetlands

A detailed excavation plan shall be developed for work in the wetlands. The plan shall also describe the restoration efforts that will be performed to ensure that the impacted wetlands are replaced at the Site. This plan shall be submitted as part of the Remedial Design for approval by EPA in consultation with PADEP prior to implementation.

Storm Water Controls

A storm water control plan shall be developed to address runoff from all areas of soil disturbance associated with Site remediation activities. The plan shall be a part of the Remedial Design submitted for approval by EPA in consultation with PADEP prior to implementation.

Backfilling and Restoration of Excavated Areas

The excavated areas, with the possible exception of wetland areas, shall be backfilled with certified Pennsylvania clean fill and compacted in 6-inch lifts to the original grade. A minimum 4-inch layer of topsoil should be applied, a vegetative cover established, and complete restoration performed over the affected area.

Air Monitoring and Fugitive Emissions Control

An air monitoring and fugitive emissions control plan shall be developed and submitted during Remedial Design for approval by EPA in consultation with PADEP prior to initiating cleanup activities.

Institutional Controls (ICs)

Fencing will be maintained and/or upgraded around the Facility to prevent vandalism and protect all property on the Site. In addition ICs, such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP would be implemented in order to protect the remedy and prevent exposure to Site contaminants.

In order to prevent any development on the property or use of the Site groundwater, the property owner would be obligated to impose and file a restrictive covenant, running with the land, that specifically precludes any disturbance of the WMA, as well as the installation of groundwater wells and the use of any groundwater from the Site. Additionally, the property owner would be obligated to file a deed notice which documents the presence of the COCs and the nature of the remedial actions taken.

There are currently local governmental controls in place, restricting the use of groundwater. The Allegheny County Health Department Regulation Section 225.2 and the Moon Township Subdivision and Land Development Ordinance, Article IV, §188-401(A)(1), would require the use of public water supplies if the Facility property were developed. Additionally, the Moon Township zoning ordinance limits the Facility property use to industrial uses only (M1).

Finally, PADEP would be requested to place and enforce the Pennsylvania Hazardous Substance Control Act (HSCA) 512 Order on the affected properties to prohibit its disturbance or use of groundwater beneath the property. The Order would also be entered onto the deeds for the Facility.

These overlapping institutional controls would help ensure the Facility property is not used for residential purposes that could result into COCs exposures, and that the contaminated groundwater associated with the Site would not be used for a potable supply.

12.3 Summary of the Estimated Remedy Costs

The total present worth cost for the Selected Remedy (Alternative 3) is $8,070,000. If Contingency 1, is implemented, the Selected Remedy increases to a total of $11,650,000. If both Contingency 1 and 2 are implemented, the total present worth cost of the remedy increases to $12,610,000.

12.4 Expected Outcome of the Selected Remedy

The Selected Remedy will reduce, to acceptable levels, risks to human health and the environment by managing the risk associated with contaminated soil and contaminated groundwater outside the WMA through containment of the WMA, by removing LNAPL from the WMA, and reducing contaminants in groundwater outside the WMA through enhanced bioattenuation. This will be accomplished by consolidating and capping contaminated soil within the WMA, installing a slurry wall to minimize migration of groundwater contamination to locations outside the WMA, constructing and operating an LNAPL recovery system to remove principal threat wastes, and implementing in situ enhanced bioattentuation for treatment of contaminated groundwater outside the WMA. In addition, should the slurry wall prove to not be effective, a contingency remedy will be implemented to pump and treat groundwater within the slurry wall area. Also, if enhanced bioattenuation is shown to not be effective, a contingency remedy to extract and treat groundwater outside the WMA will be implemented.

13.0 STATUTORY DETERMINATIONS

As previously noted, Section 121(b)(1) of CERCLA mandates that a remedial action must be protective of human health and the environment, be cost effective, and utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at the Site. Section 121(d) of CERCLA further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under Federal and state laws, unless a waiver can be justified pursuant to section 121(d)(4) of CERCLA. As discussed below, EPA has determined that the Selected Remedy meets the requirements of Section 121 of CERCLA.

13.1 Protection of Human Health and the Environment

The Selected Remedy is protective of human health and the environment because it prevents contact with on-facility surface soils, sediments, and surface water that drive potential risk concerns, and it removes the LNAPL principal threat waste from the WMA. The Selected

Remedy is further protective because it controls the migration of COCs from the WMA, and treats the COCs in the groundwater outside the WMA using *in situ* treatment. The potential human health and ecological risks associated with the off-facility soils will be mitigated by their excavation and consolidation with the WMA soil under the cap. The potential ecological risks associated with the PCBs in the shallow off-facility groundwater are addressed by this alternative through the containment of source materials (within the WMA) which will lead to natural attenuation of PCBs in the groundwater outside the WMA. The volume of COCs on-site is reduced by the LNAPL recovery system and *in situ* treatment of the contaminated groundwater. The potential human health risks associated with the contaminated groundwater are addressed by institutional controls identified earlier.

13.2 Compliance with ARARs

The Selected Remedy will comply with ARARs for surface and subsurface soils by excavating the soils in accordance with performance standards and consolidating these soils with the WMA soils under the RCRA modified cap, thus cutting off exposure pathways and controlling further migration of the COCs from the WMA by encapsulating the WMA. The point of compliance for attainment of groundwater final performance standards will be throughout the plume of groundwater contamination, beginning at the edge of the WMA, consistent with the NCP. Performance standards will be achieved at and beyond the edge of the WMA (1990 NCP Preamble at 55 Federal Register 8713). Additionally, ARARs will be achieved for areas outside the WMA by eliminating exposure pathways. Soils exceeding applicable standards will be excavated from areas outside the WMA and will be consolidated with WMA soil beneath the cap. Contaminated groundwater outside the WMA will be addressed by *in situ* treatment and institutional controls.

Any cleanup alternative selected by EPA must comply with all applicable or relevant and appropriate federal and state environmental requirements or provide the basis upon which such requirement(s) can be waived. Applicable requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the site. Relevant and appropriate requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the site that their use is well-suited to the particular circumstances. The preferred alternative satisfies the applicable and relevant and appropriate requirements. The following table lists key ARARs for the Selected Remedy.

Chemical-Specific ARARs

Chemical-specific ARARs are defined as those that specify achievement of a particular cleanup level for specific chemicals or classes of chemicals. These standards usually take the form of health- or risk-based numerical limits that restrict concentrations of various chemical substances to a specified level. Chemical-specific ARARs apply to groundwater, surface water, sediment, soil, and air for the Site.

Location-specific ARARs and TBCs

Location-specific ARARs are those which are applicable or relevant and appropriate due to the location of the site or area being remediated. For this Site, these consist of regulations applicable to wetlands, surface water bodies, and those that restrict development activities that adversely affect the existing uses, scenic character, or other natural resources of an area.

Action-specific ARARs and TBCs

Action-specific ARARs are those which are applicable or relevant and appropriate to particular remedial actions, technologies, or process options. These regulations do not define site performance standards but do affect the implementation of specific types of remediation. For example, although outdoor air has not been identified as a medium of concern, air quality ARARs are listed below, because some potential remedial actions may result in air emissions of toxic or hazardous substances. These action-specific ARARs are considered in the screening and evaluation of various technologies and process used to develop the cleanup alternatives.

CHEMICAL-SPECIFIC ARARS AND CRITERIA, ADVISORIES, AND GUIDANCE BRESLUBE-PENN SUPERFUND SITE

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Groundwater/Surface Water - Federal Regulation	SDWA-MCLs (40 CFR 141.11,141.13, 141.61-62)	Relevant and Appropriate	Maximum Contaminant Levels (MCLs) have been promulgated for a number of common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.	Since the Site is a potential source of drinking water, the groundwater will meet these requirements.
Groundwater/Surface Water - Federal Regulation	SDWA-MCLGs (40 CFR 141.50-141.51)	Relevant and Appropriate	Maximum Contaminant Level Goals (MCLGs) are health-based criteria goals that should be evaluated for drinking water sources as a result of SARA. These goals are available for a number of organic and inorganic	Since the Site is a potential source of drinking water, the non zero MCLGs to met. 300.430(e)(2)(i)(B)

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
			contaminants.	
Groundwater/Surface Water - EPA Region III RBCs	EPA Risk-Based Concentrations (RBCs) (4/07)	TBC	EPA Region III RBCs identify levels for a single contaminant in a single medium that corresponds to a given risk or hazard. Cleanup goals for some substances may have to be based on non promulgated criteria and advisories rather than on ARARs because ARARs alone would not be sufficiently protective in the given circumstances. In these situations, the performance standards, in order to meet the cleanup goals, will not be based on ARARs alone but also on TBCs.	The RBCs may be used for screening chemical constituents. The RBC table does not constitute regulation or guidance and cannot be substituted for site-specific risk assessment.
Groundwater/ Surface Water – State Regulation	DEP, Title 25, Part 1, Subpart D, Chapter 250	Relevant and Appropriate	Provides cleanup standards for groundwater protection within Pennsylvania.	More stringent statewide health standards for groundwater cleanup under ACT 2 will be met if more stringent than MCLs MCLGs or RBCs.
Groundwater/Surface Water - State Regulation	DEP, Title 25, Part 1, Subpart A, Article II, Chapter 16 and Subpart C, Article II, Chapter 93	Relevant and Appropriate	These are guidelines established pursuant to Section 304 of the Clean Water Act that set the concentrations of pollutants which are considered adequate to protect human health based on water and fish ingestion and to protect aquatic life. Ambient water quality criteria may be relevant and appropriate to CERCLA cleanups based on the uses of a water body.	The discharge of treated groundwater would meet the guidelines established for protection of aquatic life.

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE *REMEDY*
Solids/Soils - EPA Region III RBCs	EPA Risk-Based Concentrations (4/07)	TBC	EPA Region III RBCs identify levels for a single contaminant in a single medium that corresponds to a given risk or hazard. Cleanup goals for some substances may have to be based on non promulgated criteria and advisories rather than on state ARARs because state ARARs alone would not be sufficiently protective in the given circumstances. In these situations, the performance standards, in order to meet the cleanup goals, will not be based on state ARARs alone but also on TBCs.	The RBCs may be used for screening chemical constituents. The RBC table does not constitute regulation or guidance and cannot be substituted for site-specific risk assessment.
Solids/Soils - State Regulation	DEP, Title 25, Part 1, Subpart D, Chapter 250	Relevant and Appropriate	Provides cleanup standards for industrial properties within Pennsylvania.	More stringent Statewide health standards for cleanup under ACT 2 will be met if more stringent than MCLs MCLGs or RBCs.

LOCATION-SPECIFIC ARARS AND CRITERIA, ADVISORIES, AND GUIDANCE BRESLUBE-PENN SUPERFUND SITE

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Wetland - Federal Regulation	40 CFR 6.302(a), Part 6 Appendix A. Clean Water Act Section 404, 40 CFR 230.10	Applicable	Requires federal agencies to take action to avoid adversely affecting wetlands, to minimize wetlands destruction, and to preserve the value of wetlands.	The statute is applicable site-wide due to the identified wetlands in the project area which will be adversely affected by the selected remedy and/or its contingencies.
Wetland - *Federal*	40 CFR Section *6.302(b)*	Applicable	Requires federal agencies to *evaluate the potential effects*	The statute is applicable *site-wide considering cap*

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Regulation			of action they may take in a floodplain to avoid the adverse impacts associated with direct and indirect development of a floodplain.	and possible treatment facility will be developed in floodplain.
Surface Water – Federal Regulation	40 CFR 6.302 (g)	Applicable	The Federal Fish & Wildlife Coordination Act states that whenever surface water is modified by a Federal agency, the U.S. FWS must be consulted	If a pump and treat system is implemented, water will be discharged into Montour Creek. Additionally, the Creek may be modified by the presence of a discharge pipe. The added water and structure may constitute a modification of the water body
Water Bodies - State Regulation	DEP – Title 25, Part 1, Subpart C, Article II, Chapter 105.17 & 105.18a	Applicable	This requirement specifies that any dredging, filling, or erecting activity on the land adjacent to any river, stream, or brook shall not unreasonably interfere with the natural flows or lower the quality of any waters.	Permitting of structures and activities in wetlands. Since the selected remedy will excavate an entire wetland, this chapter is applicable. Additionally, if the contingent pump & treat is implemented, this Chapter will also mandate the actions to be taken.

ACTION-SPECIFIC ARARs
BRESLUBE-PENN SUPERFUND SITE

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Groundwater – Federal Regulation	40 CFR Part 144.11, 144.24, 144.25, 144.26(a)(1-5), 144.26(b)(1)(iii)(G)m 144.26(b)(2)(ii-x), 144.27, 144.82 and 144.84.	Applicable	The Underground Injection Control Program regulates the amount and means of discharging fluids into the subsurface in order to protect drinking water supplies.	Bio-remediation agent will be injected into subsurface, therefore must comply with control program.
Surface Water – State Regulation	25 PA Code Chapters 123.1-123.3, 124.7, 123.31, 123.41, 127.1, 127.11,	Relevant and Appropriate	The point source program which is based upon the NPDES program, requires a permit prior to discharge into surface water.	If the pump & treat system is implemented, treated groundwater will be discharged in Montour Creek, therefore, although a CERCLA cleanup is

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
	127.12 and 131.1-131.4.			not required to obtain a permit, the discharge of treated groundwater must meet the substantive requirements of the permit.
Surface Water – State Regulation	Pennsylvania Storm Water Management Act - 32 P.S. § 680.13	Relevant and Appropriate	Pennsylvania requires that stormwater from sites must be controlled if land is disturbed during site operations.	During intrusive construction activities, storm water controls must be in placed to limit/eliminate discharge to surface water.
Air - Federal	CAA- (NESHAPS) – 40 CFR 61.242-1-61.244	Relevant and Appropriate	Requires emission of Hazardous Air Pollutants (HAPs) from new and existing sources to be quantified, establishes ambient air quality standards and emissions limitations for HAP emission from new sources	If the pump & treat system is implemented, emission from the treatment plant would comply with this requirement.
Air – Federal	OSWER Directive 9355.0-28	TBC	Control of Air Emissions From Superfund Air Strippers at Superfund Groundwater Sites, June 15, 1989. This plociy guides the selection of control for air strippers at groundwater sites according to the air quality status of the area of the Site (i.e., whether it is an attainment or non-attainment area)	If the pump & treat system is implemented, this policy will be considered in determining if air emission controls are necessary for the air stripper. Sources most in need of the controls are those with emission rates in excess of 3 lbs/hours or 15 lbs/day or a potential rate of 10 tons/year of total VOCs.
Air – Federal	40 CFR Part 264.1030, 264.1034 and 40 CFR Part 264.1053-264.1063	TBC	As part of NESHAPS, this regulation controls the emission of toxic materials into the air. Establishes requirements for process vents and equipment leaks.	If the pump & treat system is implemented, NESHAPS regulations are not applicable to Superfund sites, but may be applicable to RCRA operations during the remedy phase for alternatives with a groundwater treatment component. (i.e., emission due to leaks from the treatment plant would comply with this requirement.
Air - State	DEP, Title 25, Subpart C, Article III, 25 PA Code Chapters 123.1-123.3, 124.7, 123.31, 123.41, 127.1, 127.11, 127.12 and 131.1-131.4.	Relevant and Appropriate	This regulation establishes ambient air quality standards that are maximum levels of a particular pollutant permitted in the ambient air.	During potential remedial activities, the 24-hour maximum particulate concentration must be maintained below the applicable levels.

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Solids/Soils – Federal	TSCA, 40 CFR Part 761.75	Applicable	These rules provide specific requirements for materials containing PCBs (typically at levels exceeding 50 ppm).	Since PCB soil will be consolidated in the WMA, containment of these soils in the WMA must comply with this section of TSCA on containment.
Solids/Soils – State	25 PA Code 264.110-264.119, 264a.120 & 264.300-351	Applicable	These rule provide specific requirements for materials containing Hazardous Waste	Since Hazardous waste will be consolidated in the WMA, containment of these soils in the WMA must comply with this section of RCRA on closure and post closure.
Solids/Soils - OSWER Soil Lead Policy (8/27/98)	OSWER Directive #9200.4-27P	Relevant and Appropriate	Lead in soil above 400 ppm can present some concerns under specific exposure scenarios. Evaluation of lead exposure should be conducted using the Integrated Exposure Uptake Biokinetic Model (IEUBK).	Where average site soil levels exceed 400 ppm, the potential for adverse impacts may be evaluated through use of the IEUBK model.
Solids/Soil – State Regulations	25 PA Code 261a.1	Relevant and Appropriate	Provides State regulations for identification of hazardous waste.	If the pump & treat system is implemented, hazardous waste may be recovered during this process. Since the groundwater may require treatment and discharge back into surface soil this section is relevant and appropriate.
Solids/Soil – State Regulations	25 PA Code 264.10-.19. (Subpart B)	Applicable	Provides State regulations for general facility standards for hazardous waste treatment, storage, and disposal facilities (TSDFs).	If the pump & treat system is implemented, hazardous waste may be recovered during this process. Since the groundwater may require treatment and discharge back into surface soil this section is applicable.
Solids/Soil – State Regulations	25 PA Code 264.31-.37	Applicable	Provides State guidelines for preparedness and prevention planning for TSDFs	If the pump & treat system is implemented, hazardous waste may be recovered during this process. Since the groundwater may require treatment and discharge back into surface soil this section is relevant and appropriate.

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Solids/Soil – State Regulations	25 PA Code 264.51-.56.	Applicable	Provides State guidelines for contingency plans and emergency procedures for TSDFs	If the pump & treat system is implemented, hazardous waste may be recovered during this process. Since the groundwater may require treatment and discharge back into surface soil this section is relevant and appropriate.
Solids/Soil – State Regulations	25 PA Code 264.a.11	Applicable	Provides State regulations for general facility standards for TSDFs	If the pump & treat system is implemented, hazardous waste may be recovered during this process. Since the groundwater may require treatment and discharge back into surface soil this section is relevant and appropriate.
Solids/Soil – State Regulations	25 PA Code 264.a.56	Applicable	Provides State guidelines for contingency plans and emergency procedures for TSDFs	These regulations supplement the RCRA hazardous waste regulations.
Solids/Soils - State Regulation	DEP, Title 25, Part 1, Subpart D, Article VII	Relevant and Appropriate	Provides Pennsylvania's regulations for hazardous waste management.	These regulations supplement the RCRA hazardous waste regulations.
Solids/Soils - State Regulation	DEP, Title 25, Part 1, Subpart D, Article IX	Relevant and Appropriate	Provides Pennsylvania's regulations for residual waste management.	These regulations provide criteria for the management and disposal of industrial wastes that are not RCRA-hazardous.
Erosion and Sediment Control During Construction	DEP, Title 25 Chapter 102.11 and 102.22	Applicable	Establishes requirements for erosion and sedimentation control during earth disturbance	The selected remedy involves excavation and so this process will need to include actions to properly manage erosion and sedimentation control during excavation or for any construction in creating treatment facilities for the pump and treat alternative
Modification or Encroachment Into Wetlands	Fish & Wildlife Coordination Act	TBC	Requires consultation with U.S. Fish & Wildlife Service prior to modification or encroachment into wetlands	Because the selected remedy will directly impact wetlands, the remedy will need to include provisions for coordination with the Fish & Wildlife Service
Offsite Transport and Disposal of Hazardous Waste	40 CFR Section 262.11/25 PA Code 262a	Applicable	Establishes requirements for testing, manifesting, packaging, labeling, recordkeeping, and reporting for hazardous wastes generated	The removal of LNAPL will most likely contain Hazardous waste, therefore these RCRA treatment and disposal requirement apply. Additionally, if a pump and treat system is implemented, treatment and/or disposal of hazardous waste may also be required.

ARAR OR TBC Media/Program	LEGAL CITATION	CLASSIFICATION	SUMMARY OF REQUIREMENT	FURTHER DETAIL REGARDING ARARS IN THE CONTEXT OF THE REMEDY
Standards for Materials for Offsite Disposal	DEP, Title 25 Chapter 268	Applicable	Establishes requirements for materials that will be disposed in landfills	The removal of LNAPL will most likely contain Hazardous waste, therefore these RCRA treatment and disposal requirement apply. Additionally, if a pump and treat system is implemented, treatment and/or disposal of hazardous waste may also be required.
Management and Disposal of Residual Wastes	DEP, Title 25 Chapter 287	Applicable	Establishes requirements for management of residual wastes	Residual wastes produced during remedial actions will need to be managed in accordance with the residual waste regulations.

13.3 Cost Effectiveness

EPA has determined that the Selected Remedy is cost effective in mitigating the principal risks posed by contaminants at the Site. Section 300.430(f)(ii)(D) of the NCP requires evaluation of cost effectiveness. Overall effectiveness is determined by the following three balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost effective.

The RCRA-modified cap, slurry wall, and LNAPL recovery system proposed for the WMA all have proven long-term effectiveness, and will control migration of COCs from the WMA in groundwater. The *in situ* groundwater treatment will effectively reduce current levels of COCs in groundwater outside the WMA. COCs mobility is also controlled by the cap and slurry wall installation. The long-term effectiveness is reduced somewhat due to COCs that remain within the WMA.

Consistent with EPA's cleanup expectations as specified in the NCP (40 CFR 300.430(a)(1)(iii)), the Selected Remedy uses removal and off-site treatment or disposal of the LNAPL to remediate the principal threat waste, and a combination of treatment, containment, and institutional controls for remaining wastes and impacted environmental media. The Selected Remedy will reduce the volume of COCs using the LNAPL recovery system and also reduces the volume and toxicity of COCs in the groundwater outside the WMA by implementation of the *in situ* groundwater treatment.

There will be limited risks associated with the materials containing COCs that will be brought to the surface during installation of the slurry wall. The installation of the RCRA-modified cap and *in situ* treatment of the contaminated groundwater outside the WMA will pose little if any risk to workers or the community. The risks associated with the slurry wall installation and other remedial activities can be controlled by implementation of common health and safety and construction techniques.

The Selected Remedy meets the criteria and provides for overall effectiveness in proportion to its cost. The estimated present worth of the Selected Remedy ranges from $8,070,000 without contingencies to $12,610,000 with both contingencies.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the Selected Remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable, and provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element and considering State and community acceptance.

The removal of LNAPL from the WMA and the *in situ* treatment with the contingency option of *ex situ* treatment of contaminated groundwater outside the WMA are permanent treatment solutions. In addition, installation of the slurry wall will permanently contain contaminated groundwater within WMA.

13.5 Preference for Treatment as a Principal Element

By removing LNAPL from on-facility groundwater and *in situ* treatment with the contingency option of *ex situ* treatment of contaminated groundwater outside the WMA, the Selected Remedy satisfies the statutory preference for remedies that employ treatment as a principal element.

13.6 Five-Year Review Requirements

Because the Selected Remedy will result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure, a statutory review will be conducted at least every five years after initiation of remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

14.0 DOCUMENTATION OF SIGNIFICANT CHANGES

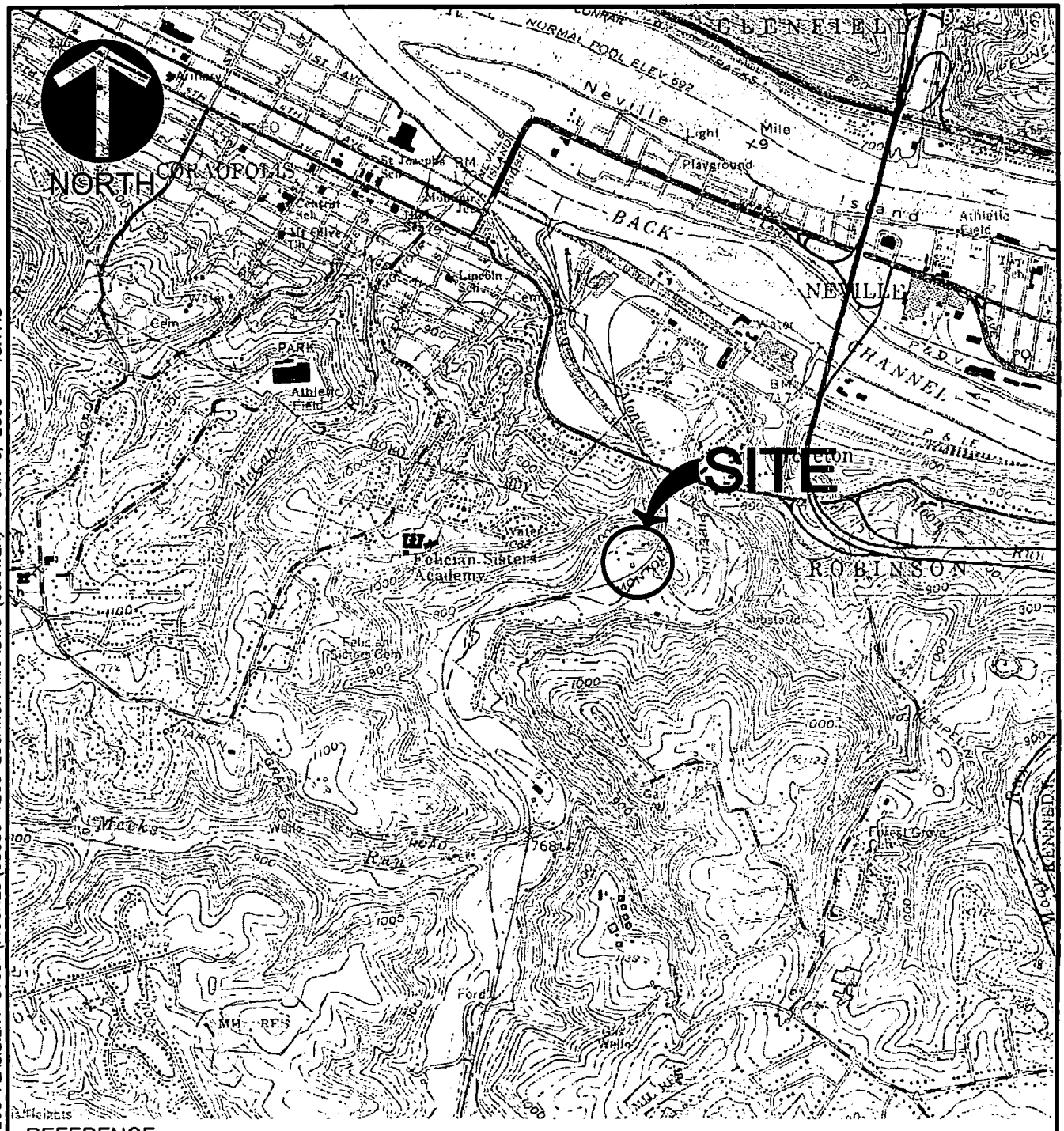
The Proposed Plan for the Breslube-Penn Superfund Site was released for public comment on March 30, 2007 and the public comment period ran from that date through April 30, 2007. The Proposed Plan identified Alternative 4 (**the same alternative is identified as Alternative 3 in this ROD, see table below**) as the Preferred Alternative. Alternative 2 mentioned in the Proposed Plan is not considered in this ROD. As explained in the Proposed Plan section VII, under the heading *Overall Protection of Human Health and the Environment* (page 33), Alternative 2 described in the Proposed Plan does not meet the performance standards of preventing or reducing the migration of contaminated groundwater from the source area and therefore it was eliminated from consideration in this ROD. Thus the sequence of the alternatives was changed as follows:

Explanation of the difference from the Proposed Plan		
Propose Plan Alternatives Numbers	ROD Alternatives Numbers	Changes
1	1	Retained
2	-	Eliminated
Explanation of the difference from the Proposed Plan..Cont.		
Propose Plan Alternatives Numbers	ROD Alternatives Numbers	Changes
3	2	Retained
4	3	Retained
5	4	Retained
6	5	Retained

All written and verbal comments submitted during the public comment period were reviewed by EPA. Upon review of these comments, EPA has determined that no significant changes to the preferred remedy, as it was originally identified in the Proposed Plan were necessary.

Appendix I

FIGURES



REFERENCE:
U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAPS, AMBRIDGE, PA QUADRANGLE, DATED: 1960, PHOTOREVISED 1979; AND OAKDALE, PA QUADRANGLE, DATED: 1960, PHOTOREVISED: 1990, SCALE: 1"=2000'.

SCALE IN FEET
0 2000 4000

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SITE LOCATION MAP
FEASIBILITY STUDY REPORT
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=2000'	DATE: 01/05/06	PROJECT NO: 98838.1200	FIGURE 1
CHKD. BY:				

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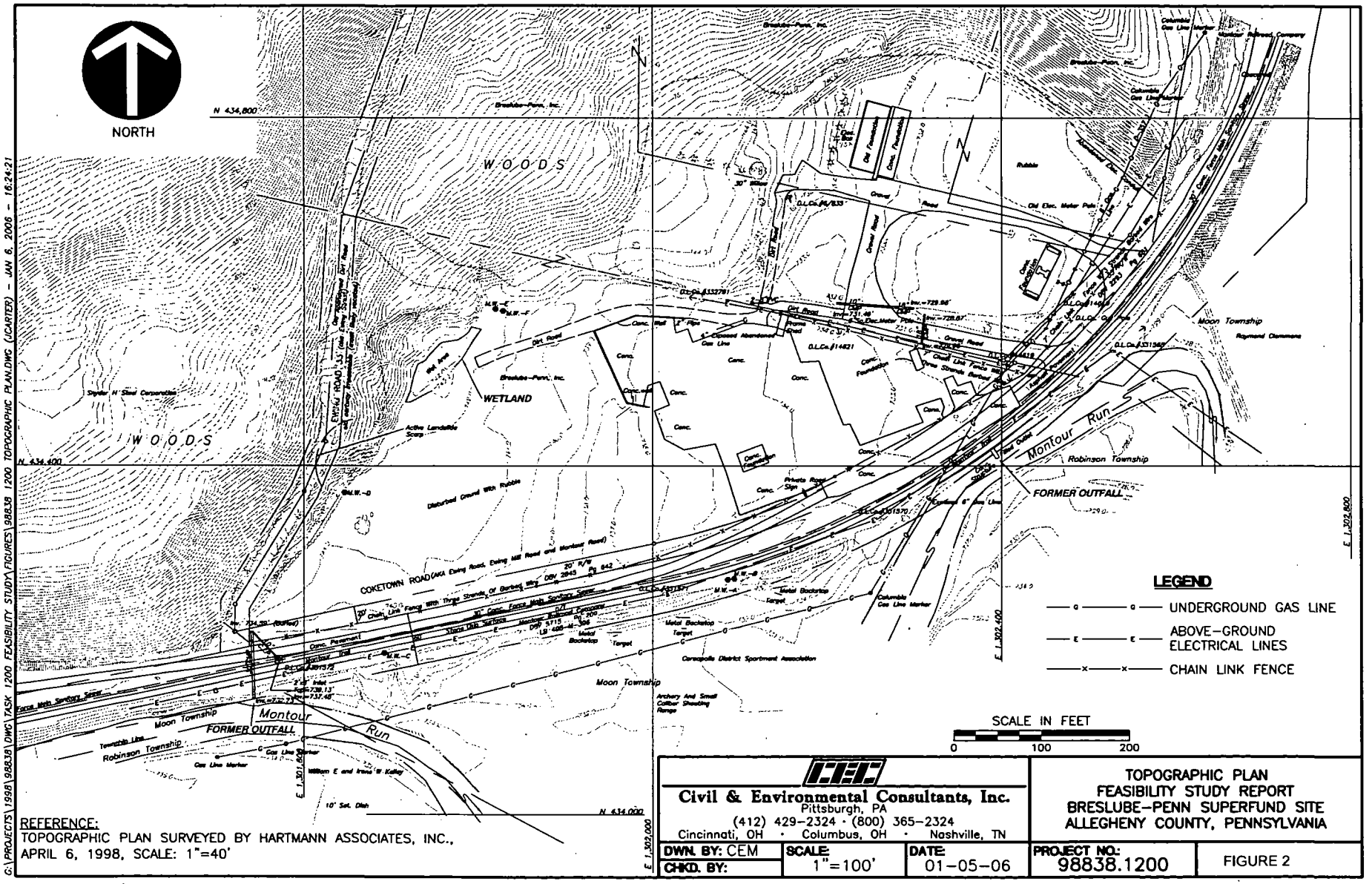

REFERENCE:
TOPOGRAPHIC PLAN SURVEYED BY HARTMANN ASSOCIATES, INC., APRIL 6, 1998, SCALE: 1"=40'

C:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\FIGURES\98838 1200 TOPOGRAPHIC PLAN.DWG (JCARTER) - JAN 6, 2006 - 16:24:21

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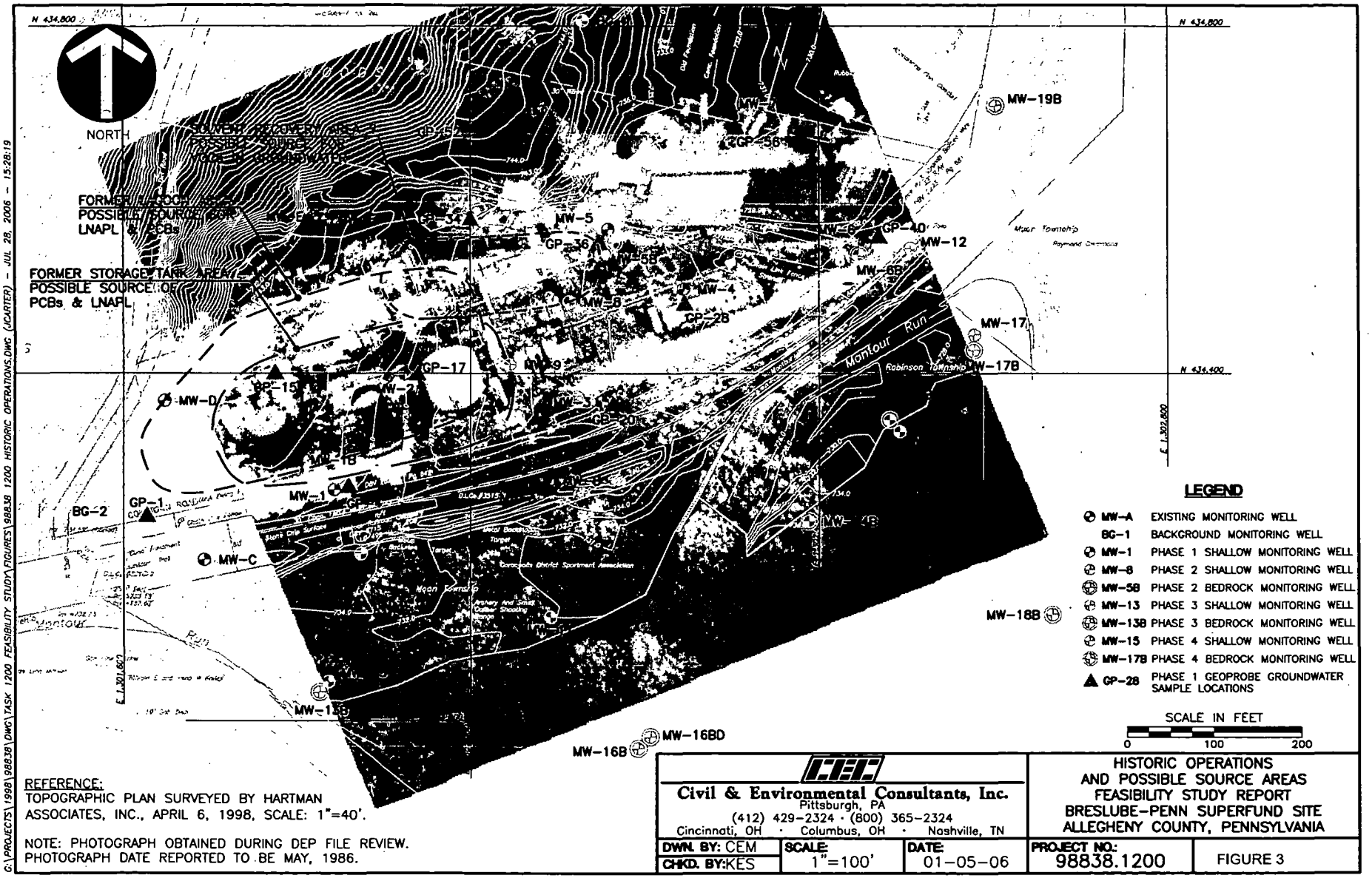
TOPOGRAPHIC PLAN
FEASIBILITY STUDY REPORT
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=100'	DATE: 01-05-06	PROJECT NO.: 98838.1200	FIGURE 2
CHKD. BY:				

AR307714



REFERENCE:
TOPOGRAPHIC PLAN SURVEYED BY HARTMAN ASSOCIATES, INC., APRIL 6, 1998, SCALE: 1"=40'.

NOTE: PHOTOGRAPH OBTAINED DURING DEP FILE REVIEW. PHOTOGRAPH DATE REPORTED TO BE MAY, 1986.

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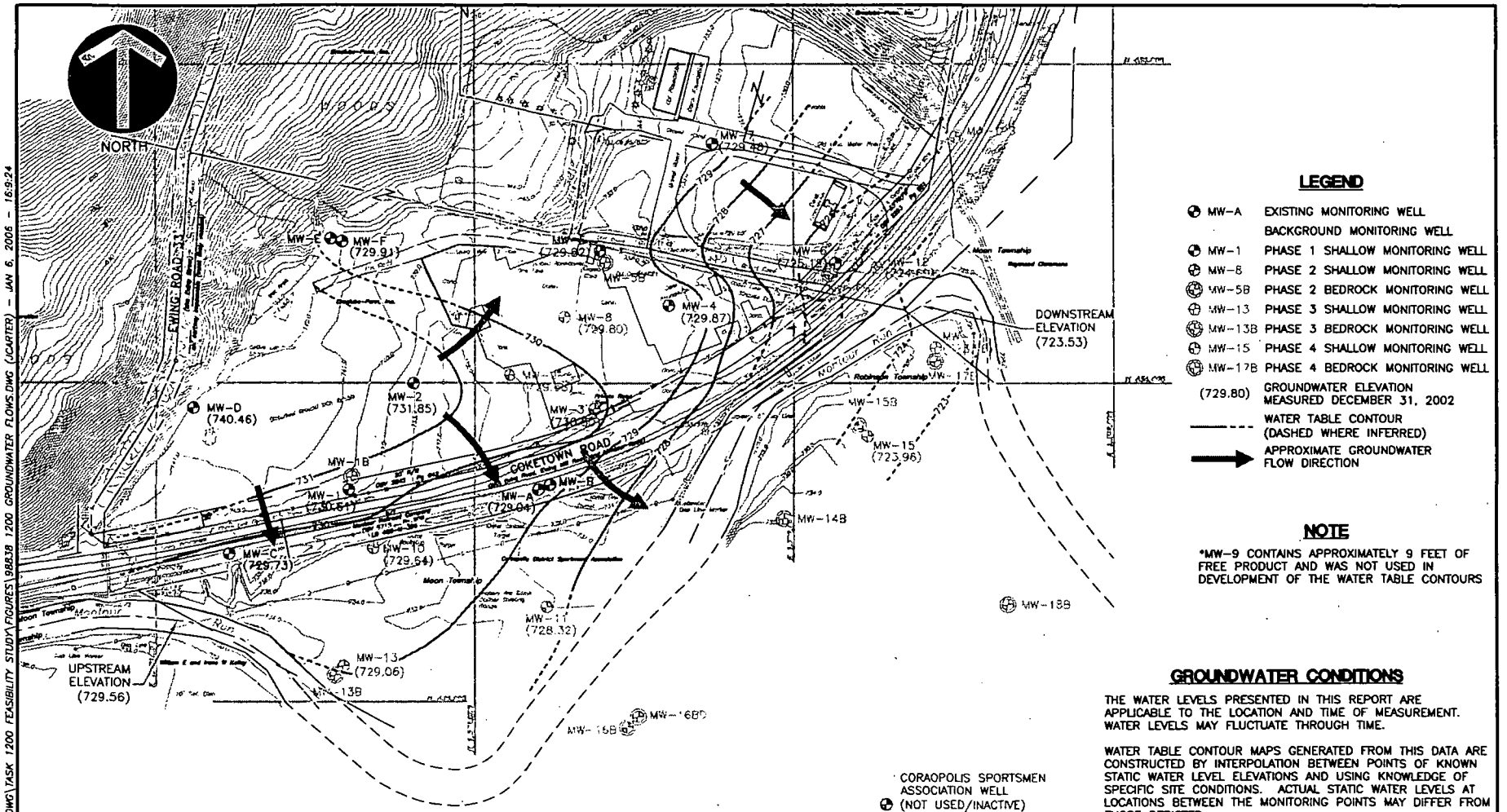
HISTORIC OPERATIONS AND POSSIBLE SOURCE AREAS
FEASIBILITY STUDY REPORT
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=100'	DATE: 01-05-06	PROJECT NO: 98838.1200	FIGURE 3
CHKD. BY: KES				

G:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\FIGURES\98838 1200 HISTORIC OPERATIONS.DWG (JCARTER) - JUL 28, 2006 - 15:28:19



LEGEND

- MW-A — EXISTING MONITORING WELL
- BACKGROUND MONITORING WELL
- MW-1 — PHASE 1 SHALLOW MONITORING WELL
- MW-8 — PHASE 2 SHALLOW MONITORING WELL
- MW-5B — PHASE 2 BEDROCK MONITORING WELL
- MW-13 — PHASE 3 SHALLOW MONITORING WELL
- MW-13B — PHASE 3 BEDROCK MONITORING WELL
- MW-15 — PHASE 4 SHALLOW MONITORING WELL
- MW-17B — PHASE 4 BEDROCK MONITORING WELL
- (729.80) — GROUNDWATER ELEVATION MEASURED DECEMBER 31, 2002
- WATER TABLE CONTOUR (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE

*MW-9 CONTAINS APPROXIMATELY 9 FEET OF FREE PRODUCT AND WAS NOT USED IN DEVELOPMENT OF THE WATER TABLE CONTOURS

GROUNDWATER CONDITIONS

THE WATER LEVELS PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION AND TIME OF MEASUREMENT. WATER LEVELS MAY FLUCTUATE THROUGH TIME.

WATER TABLE CONTOUR MAPS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF KNOWN STATIC WATER LEVEL ELEVATIONS AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. ACTUAL STATIC WATER LEVELS AT LOCATIONS BETWEEN THE MONITORING POINTS MAY DIFFER FROM THOSE DEPICTED.

REFERENCE:
TOPOGRAPHIC PLAN SURVEYED BY HARTMANN ASSOCIATES, INC., APRIL 6, 1998, SCALE: 1"=40'

SCALE IN FEET
0 120 240

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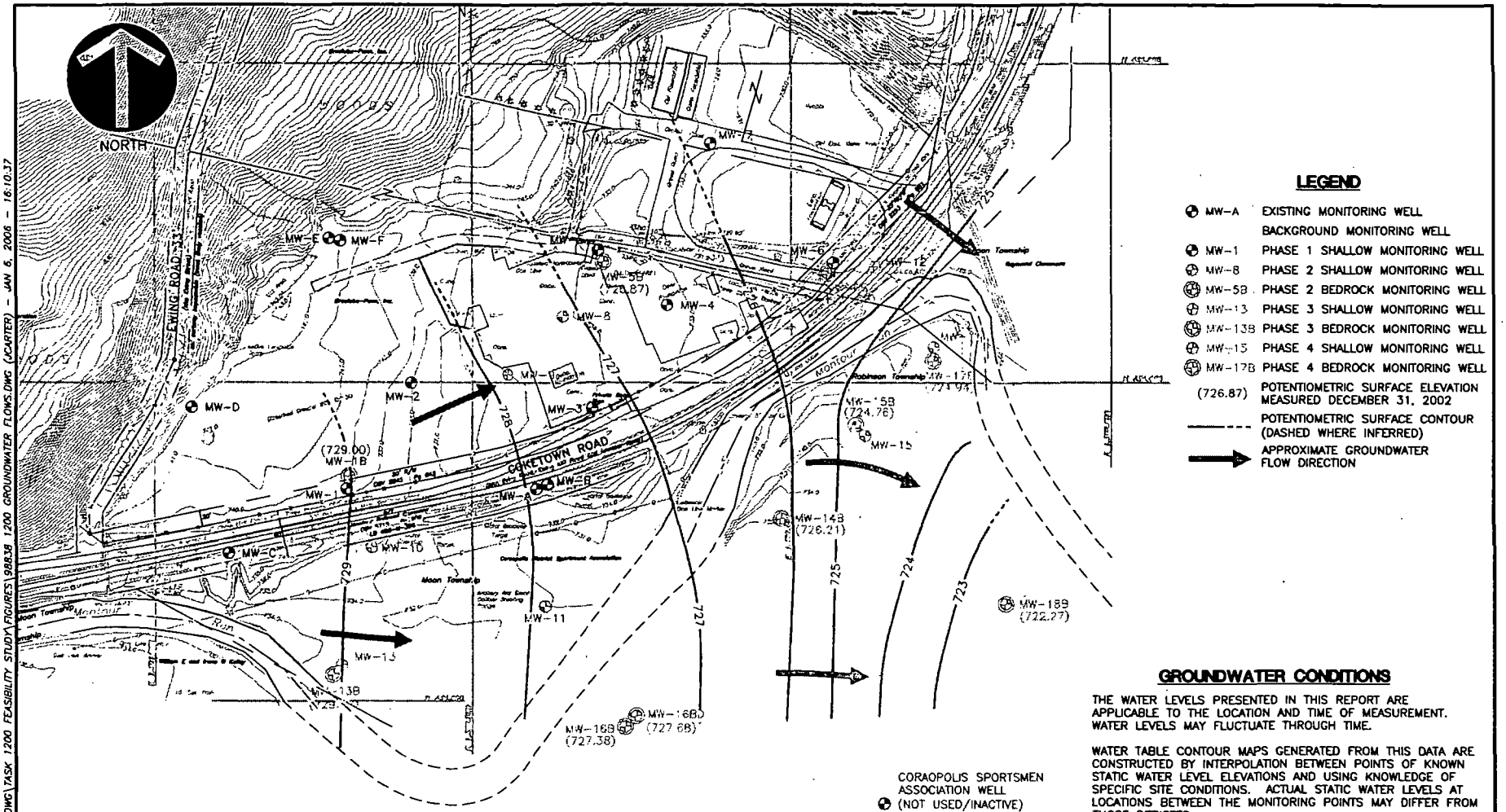
SHALLOW GROUNDWATER FLOW
FEASIBILITY STUDY REPORT
BRESLUBE– PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=120'	DATE: 01/05/06	PROJECT NO.: 98838.1200	FIGURE 4
CHKD. BY:				

G:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\FIGURES\98838 1200 GROUNDWATER FLOWS.DWG (JCARTER) – JAN 6, 2006 – 16:9:24



LEGEND

- MW-A — EXISTING MONITORING WELL
- BACKGROUND MONITORING WELL
- MW-1 — PHASE 1 SHALLOW MONITORING WELL
- MW-8 — PHASE 2 SHALLOW MONITORING WELL
- MW-5B — PHASE 2 BEDROCK MONITORING WELL
- MW-13 — PHASE 3 SHALLOW MONITORING WELL
- MW-13B — PHASE 3 BEDROCK MONITORING WELL
- MW-15 — PHASE 4 SHALLOW MONITORING WELL
- MW-17B — PHASE 4 BEDROCK MONITORING WELL
- (726.87) — POTENTIOMETRIC SURFACE ELEVATION MEASURED DECEMBER 31, 2002
- POTENTIOMETRIC SURFACE CONTOUR (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

GROUNDWATER CONDITIONS

THE WATER LEVELS PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION AND TIME OF MEASUREMENT. WATER LEVELS MAY FLUCTUATE THROUGH TIME.

WATER TABLE CONTOUR MAPS GENERATED FROM THIS DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF KNOWN STATIC WATER LEVEL ELEVATIONS AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. ACTUAL STATIC WATER LEVELS AT LOCATIONS BETWEEN THE MONITORING POINTS MAY DIFFER FROM THOSE DEPICTED.

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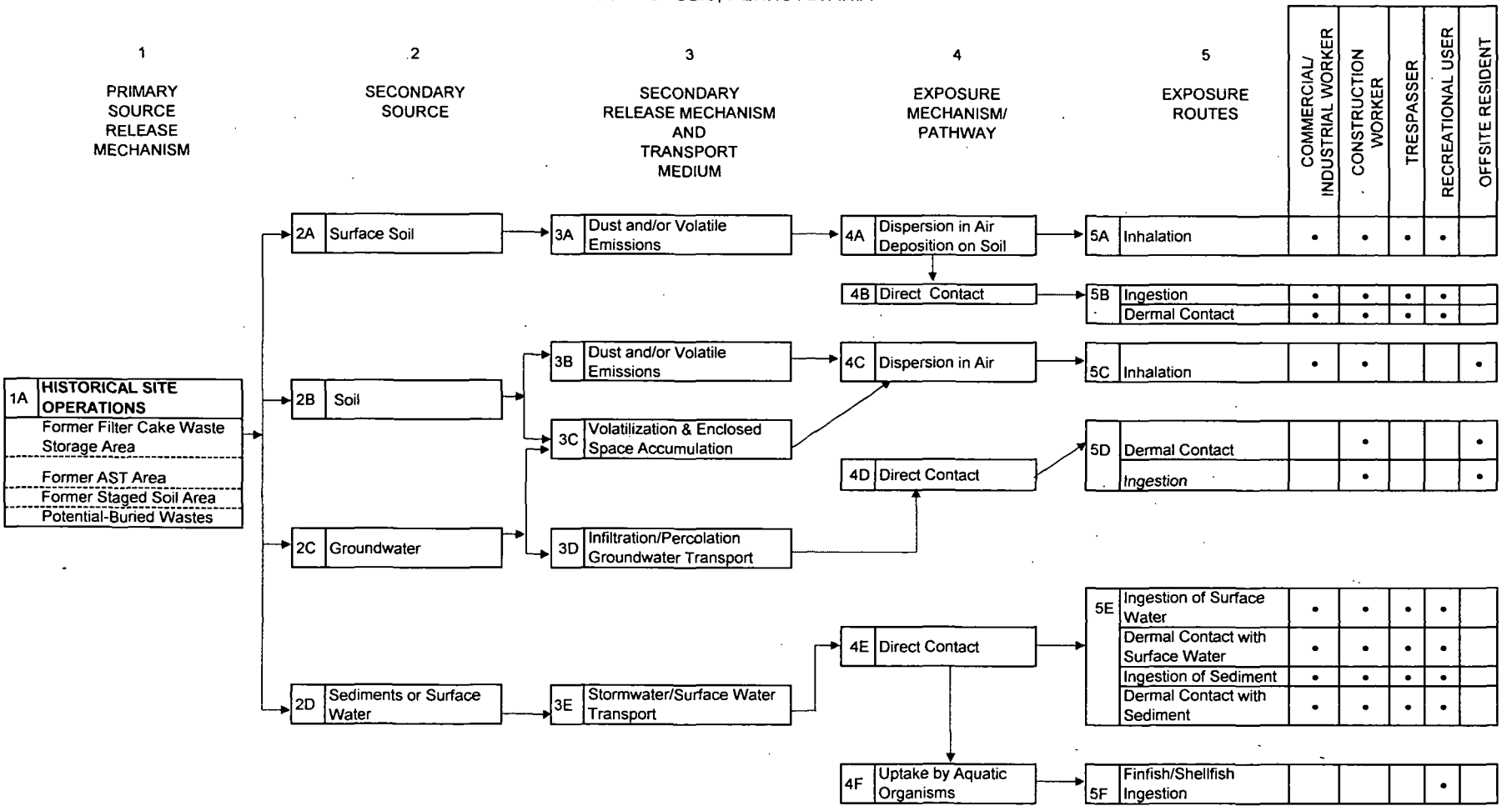
BEDROCK GROUNDWATER FLOW FEASIBILITY STUDY REPORT BRESLUBE– PENN SUPERFUND SITE ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=120'	DATE: 01/05/06	PROJECT NO: 98838.1200	FIGURE 5
CHKD. BY:				

G:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\FIGURES\98838 1200 GROUNDWATER FLOWS.DWG (JCARTER) - JAN 6, 2006 - 16:10:37

FIGURE 7

CONCEPTUAL SITE MODEL - HUMAN HEALTH
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA



Red arrows indicate potential contaminant pathways

• Indicates receptor for evaluation

FIGURE 8

FINAL SITE MODEL - HUMAN HEALTH
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

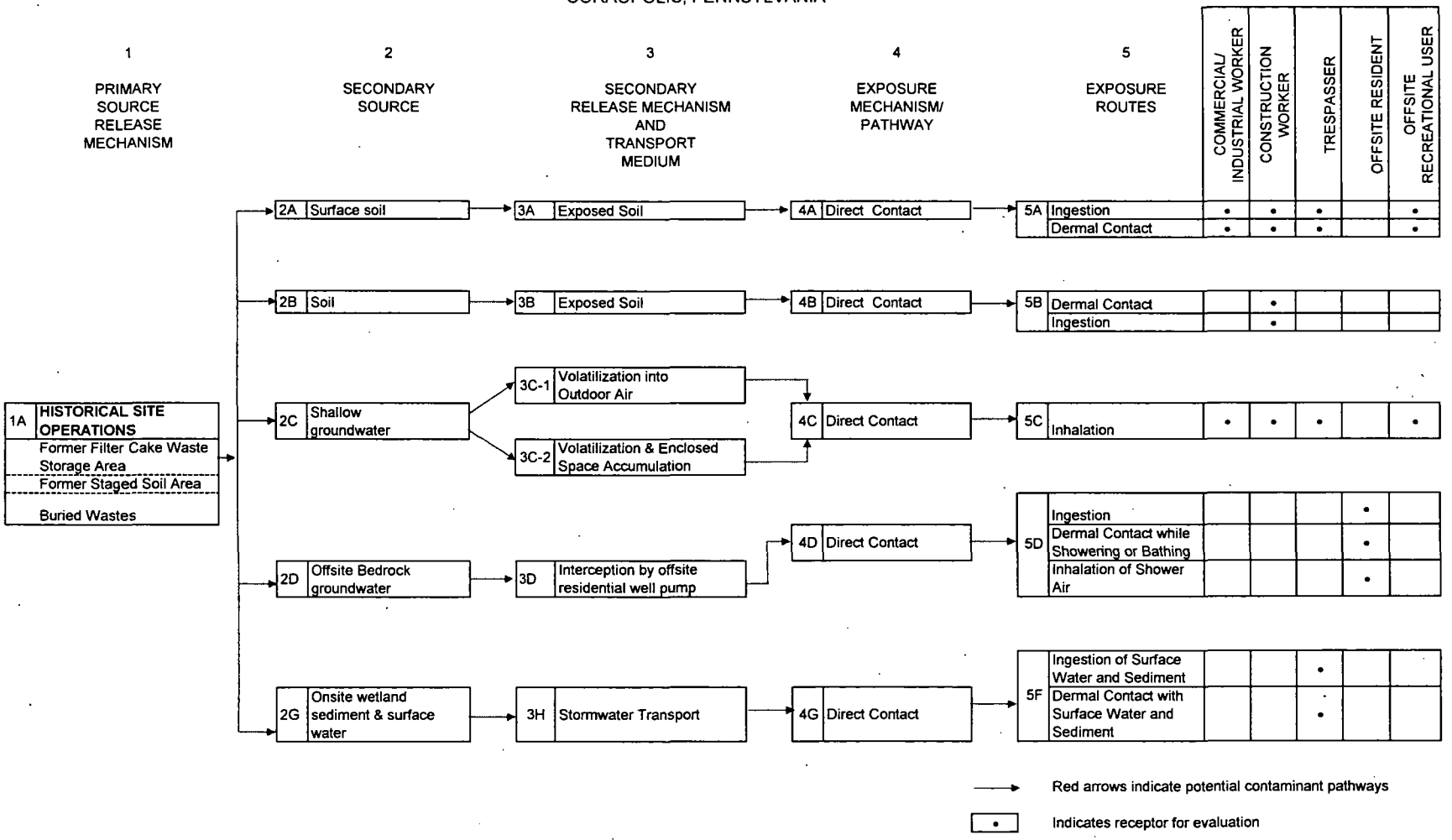
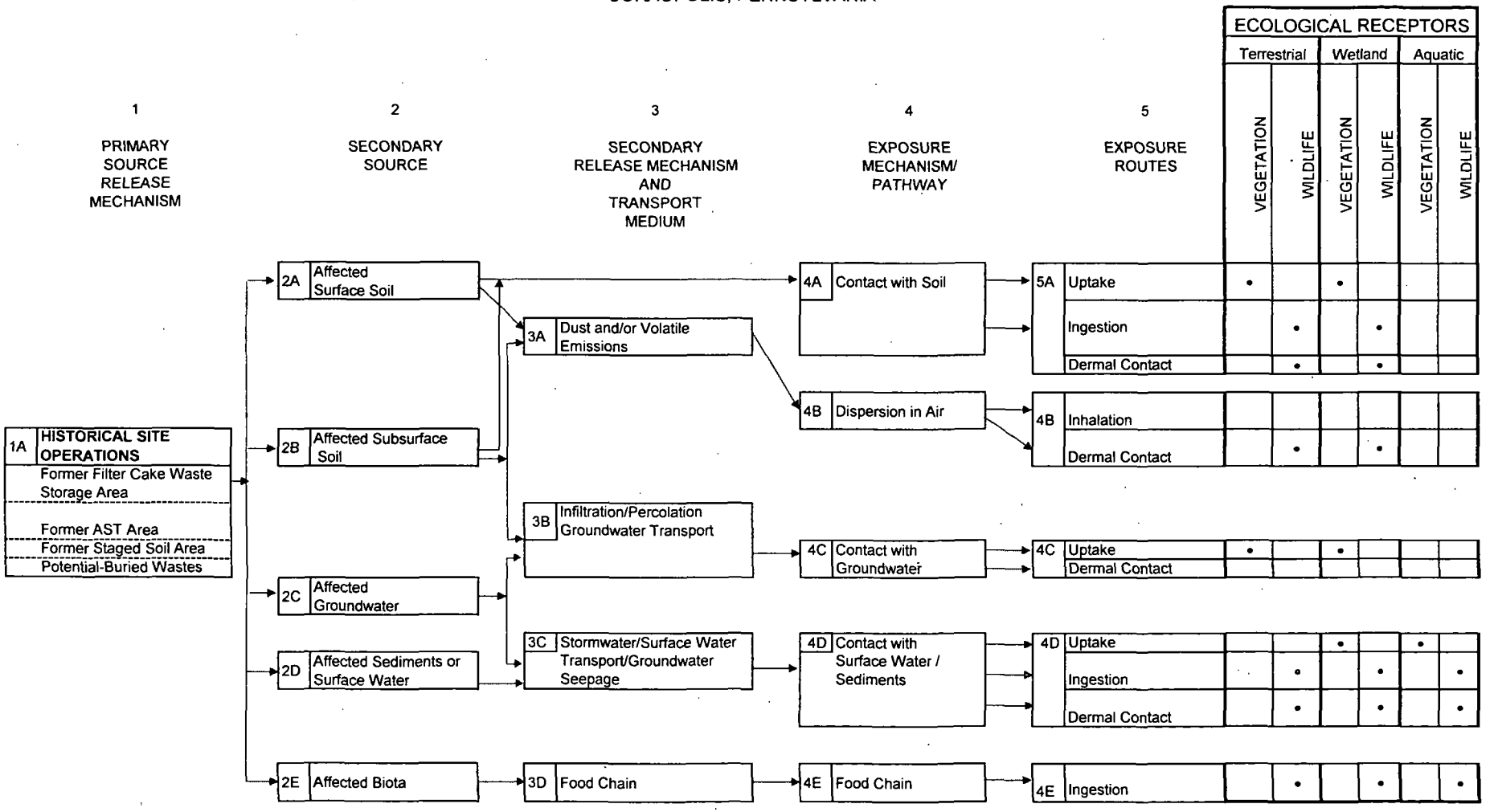


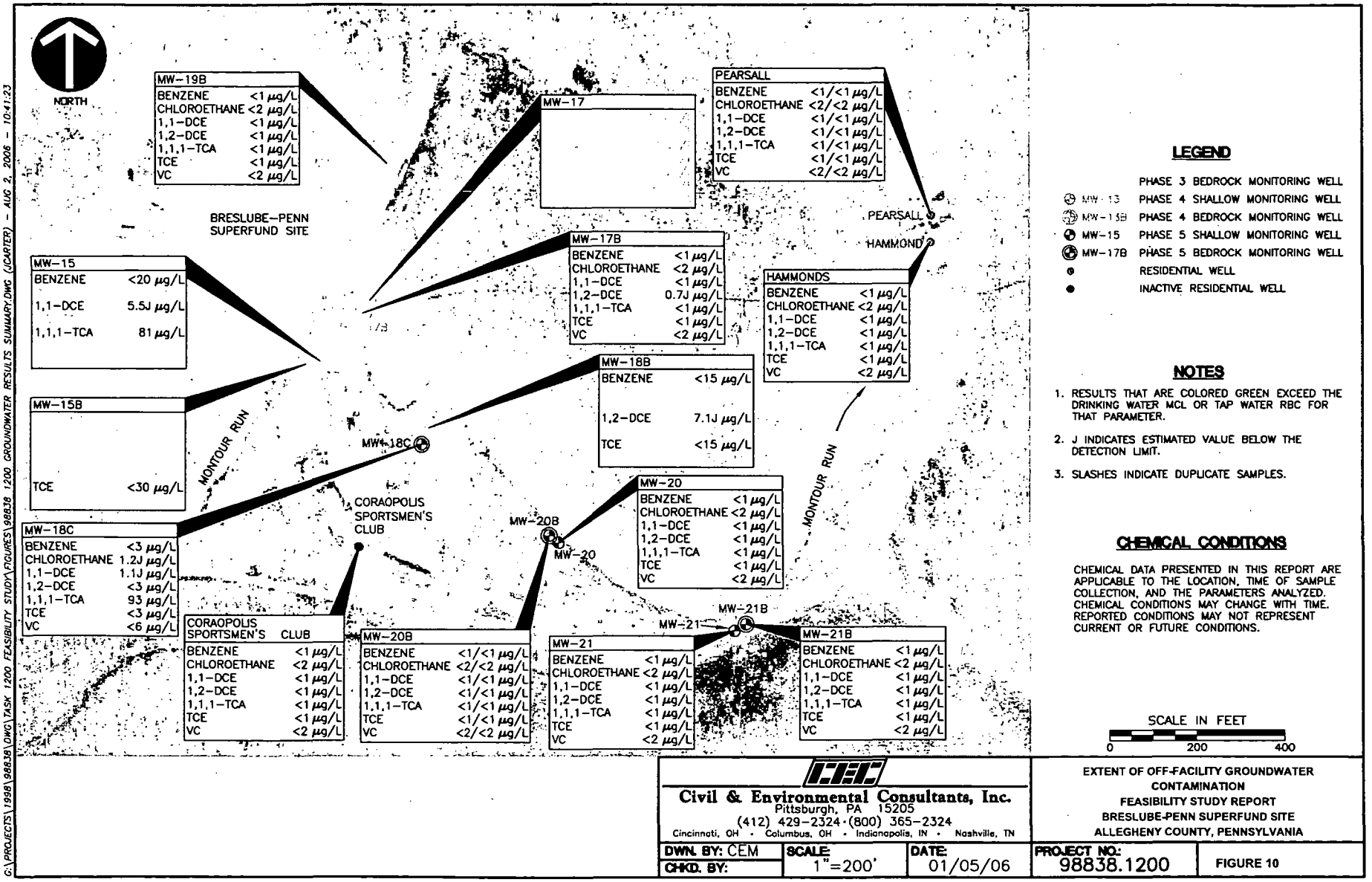
FIGURE 9
ECOLOGICAL RISK SCREENING

CONCEPTUAL SITE MODEL - ECOLOGICAL RECEPTORS - BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA



Red arrows indicate potential contaminant pathways

• Indicates receptor for evaluation



LEGEND

- PHASE 3 BEDROCK MONITORING WELL
- MW-13 PHASE 4 SHALLOW MONITORING WELL
- MW-13B PHASE 4 BEDROCK MONITORING WELL
- MW-15 PHASE 5 SHALLOW MONITORING WELL
- MW-17B PHASE 5 BEDROCK MONITORING WELL
- RESIDENTIAL WELL
- INACTIVE RESIDENTIAL WELL

NOTES

1. RESULTS THAT ARE COLORED GREEN EXCEED THE DRINKING WATER MCL OR TAP WATER RBC FOR THAT PARAMETER.
2. J INDICATES ESTIMATED VALUE BELOW THE DETECTION LIMIT.
3. SLASHES INDICATE DUPLICATE SAMPLES.

CHEMICAL CONDITIONS

CHEMICAL DATA PRESENTED IN THIS REPORT ARE APPLICABLE TO THE LOCATION, TIME OF SAMPLE COLLECTION, AND THE PARAMETERS ANALYZED. CHEMICAL CONDITIONS MAY CHANGE WITH TIME. REPORTED CONDITIONS MAY NOT REPRESENT CURRENT OR FUTURE CONDITIONS.

SCALE IN FEET
0 200 400

C:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\FIGURES\98838 1200 GROUNDWATER RESULTS SUMMARY.DWG (JCARTER) - AUG 2, 2006 - 10:41:23

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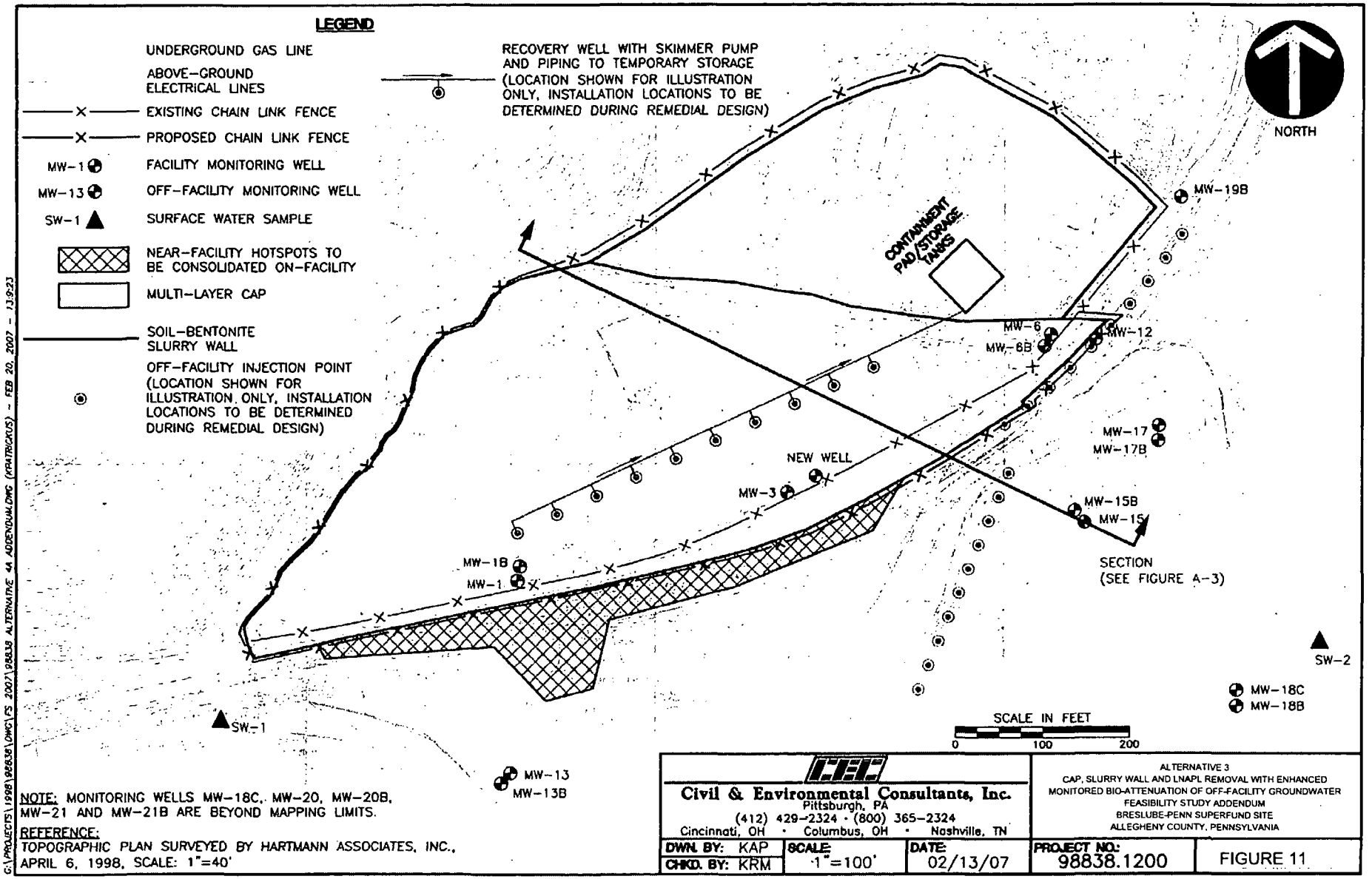
EXTENT OF OFF-FACILITY GROUNDWATER CONTAMINATION
FEASIBILITY STUDY REPORT
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: CEM	SCALE: 1"=200'	DATE: 01/05/06	PROJECT NO.: 98838.1200	FIGURE 10
CHKD. BY:				



NOTE: MONITORING WELLS MW-18C, MW-20, MW-20B, MW-21 AND MW-21B ARE BEYOND MAPPING LIMITS.

REFERENCE:
TOPOGRAPHIC PLAN SURVEYED BY HARTMANN ASSOCIATES, INC., APRIL 6, 1998, SCALE: 1"=40'

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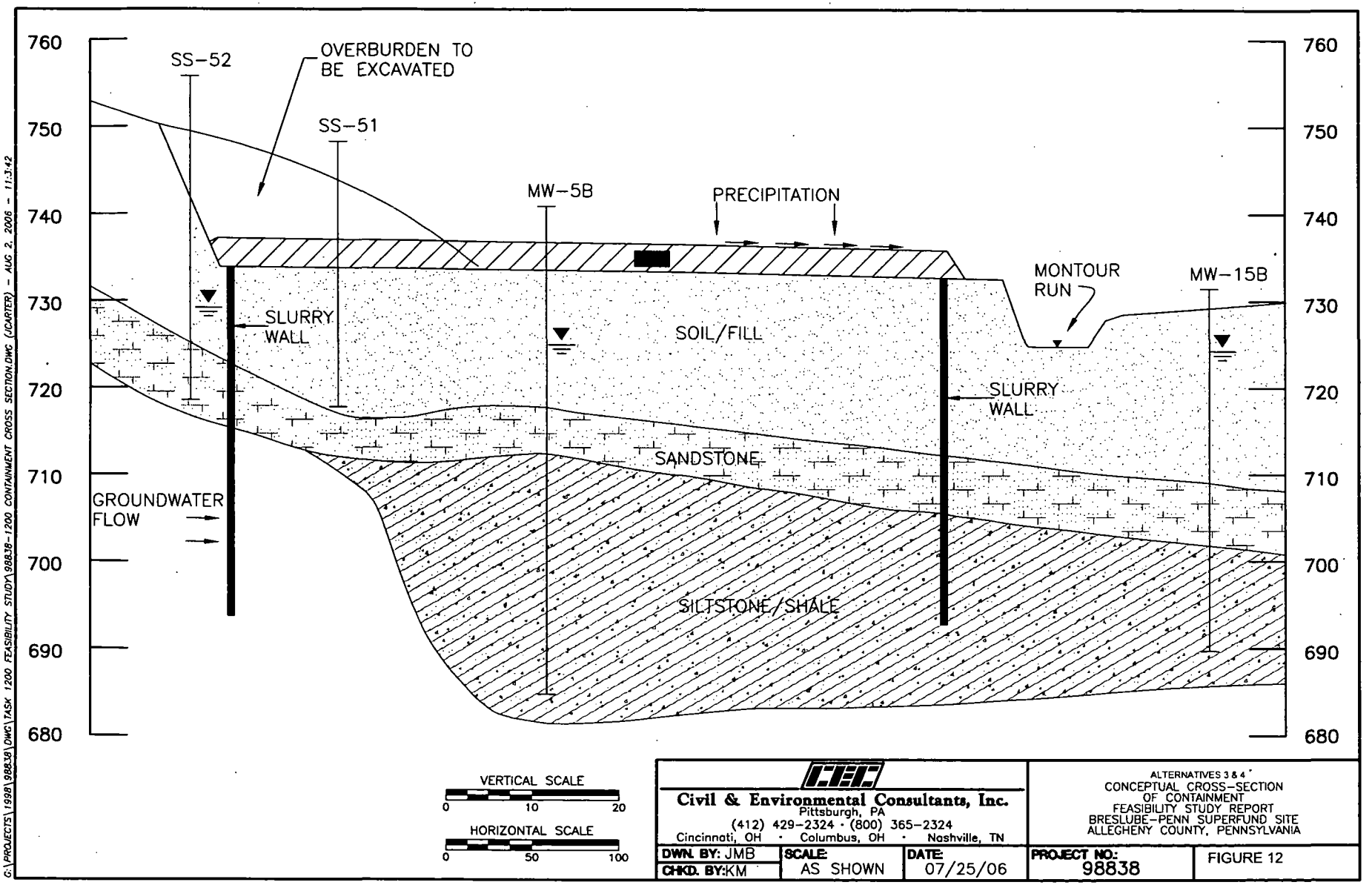
ALTERNATIVE 3
CAP, SLURRY WALL AND LNAPL REMOVAL WITH ENHANCED MONITORED BIO-ATTENUATION OF OFF-FACILITY GROUNDWATER
FEASIBILITY STUDY ADDENDUM
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: KAP	SCALE: 1"=100'	DATE: 02/13/07	PROJECT NO: 98838.1200	FIGURE 11
CHKD. BY: KRM				

C:\PROJECTS\1998\98838\DWG\FS 2007\98838 ALTERNATIVE 4A ADDENDUM.DWG (KRATRICUS) - FEB 20, 2007 - 13:9:23



G:\PROJECTS\1998\98838\DWG\TASK 1200 FEASIBILITY STUDY\98838-1200 CONTAINMENT CROSS SECTION.DWG (JCARTER) - AUG 2, 2006 - 11:3:42

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ALTERNATIVES 3 & 4
CONCEPTUAL CROSS-SECTION OF CONTAINMENT
FEASIBILITY STUDY REPORT
BRESLUBE-PENN SUPERFUND SITE
ALLEGHENY COUNTY, PENNSYLVANIA

DWN. BY: JMB	SCALE:	DATE:	PROJECT NO:	FIGURE 12
CHKD. BY: KM	AS SHOWN	07/25/06	98838	

Appendix II

Tables

TABLE 1
SUMMARY OF CHEMICALS OF INTEREST
ON-FACILITY SURFACE SOIL
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration mg/kg	Minimum Concentration mg/kg	Average Concentration[1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Industrial Soils (mg/kg)	Screening Criteria SC[2,3] (mg/kg)	Number of Times Detected Above SC
SURFACE SOILS (0 - 0.5 feet)											
Dioxin/Furans											
2,3,7,8-Tetrachlorodibenzodioxin (TEQ	1746016	C	12	12	88.023 pg/g (EPA) 83.903 pg/g (WHO)	0.073 pg/g (EPA) 0.007 pg/g (WHO)	40.69 pg/g	BP-S-FLD-008	19 pg/g	19 pg/g	7
Semi-Volatile Organic Compounds											
Benzo(a)anthracene	56553	C	74	59	34	ND	0.78	BP-S-FLD-029	3.9E+00	3.9E+00	1
Benzo(a)pyrene	50328	C	74	54	27	ND	0.72	BP-S-FLD-029	3.9E-01	3.9E-01	13
Benzo(b)fluoranthene	205992	C	74	57	25	ND	0.71	BP-S-FLD-029	3.9E+00	3.9E+00	1
Dibenzo(a,h)anthracene	53703	C	74	19	3.1	ND	0.21	BP-S-FLD-029	3.9E-01	3.9E-01	1
Indeno(1,2,3-cd)pyrene	193395	C	74	52	8.4	ND	0.35	BP-S-FLD-029	3.9E+00	3.9E+00	1
Polychlorinated Biphenyls											
Arochlor 1260	11096825	C	74	62	94	ND	16.33	BP-S-FLD-025	1.4E+00	1.4E+00	40
Metals											
Arsenic	7440382	C	74	74	42.8	2.4	12.67	BP-S-FLD-103	1.9E+00	1.9E+00	74
Iron	7439896	N	74	74	122,000	12,600	40,020.27	BP-S-FLD-101	3.1E+05	3.1E+04	44
Lead	7439921	---	74	74	1,290	16.7	359.95	BP-S-FLD-014	400 (OSWER)	400 (OSWER)	23
Manganese	7439965	N	74	74	24,300	239	2,464.59	BP-S-FLD-004	2.0E+04	2.0E+03	12
Vanadium	7440622	N	74	74	700	11.2	71.72	BP-S-FLD-056	1.0E+03	1.0E+02	7

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would slightly but not significantly, increase the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 2
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY SURFACE SOILS
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration mg/kg	Minimum Concentration mg/kg	Average Concentration[1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Residential Soils (mg/kg)	Screening Criteria SC[2,3] (mg/kg)	Number of Times Detected Above SC
SURFACE SOILS (0 - 0.5 feet)											
Semi-Volatile Organic Compounds											
Benzo(a)pyrene	207089	C	7	6	0.29	ND	0.15	BP-S-FLD-71 (0-2)	8.7E-02	8.7E-02	4
Polychlorinated Biphenyls											
Arochlor 1242	53469219	C	15	1	0.93	ND	0.93	BP-SS-FLD-74 (0-2)	3.2E-01	3.2E-01	1
Arochlor 1254	11097691	C	15	7	6.7	ND	1.03	BP-S-FLD-71 (0-2)	3.2E-01/ 1.56E+00	1.56E-01	1
Arochlor 1260	11096825	C	15	8	6.4	ND	2.29	BP-S-FLD-72 (0-2)	3.2E-01	3.2E-01	6
Metals											
Aluminum	7429905	N	7	7	18,600	7,480	11,591	BP-SS-FLD-74 (0-2)	7.8E+04	7.8E+03	6
Arsenic	7440382	C	7	7	33.6	5.9	17.8	BP-S-FLD-71(0-2)	4.3E-01	4.3E-01	7
Iron	7439896	N	7	7	73,300	28,600	53,457	BP-S-FLD-108	2.3E+04	2.3E+03	7
Lead	7439921	---	7	7	470	41.3	134.1	BP-SS-FLD-74 (0-2)	400 (OSWER)	400 (OSWER)	1
Manganese	7439965	N	7	7	13,100	644	2,864	BP-SS-FLD-74 (0-2)	1.6E+03	1.6E+02	7
Vanadium	7440622	N	7	7	141	20	41.7	BP-SS-FLD-74 (0-2)	7.8E+01	7.8E+00	7

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would slightly but not significantly, increase the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 3
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY SUBSURFACE SOILS
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration mg/kg	Minimum Concentration mg/kg	Average Concentration[1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Industrial Soils (mg/kg)	Screening Criteria SC[2,3] (mg/kg)	Number of Times Detected Above SC
SUBSURFACE SOILS (>0.5 feet)											
Dioxin/Furans											
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	1746016	C	6	6	156.85 pg/g (EPA) 154.26 pg/g (WHO)	29.58 pg/g (EPA) 29.48 pg/g (WHO)	90.95 pg/g	BP-S-FLD-008	19 pg/g	19 pg/g	6
Volatile Organic Compounds											
Tetrachloroethene	127184	C	134	36	27	ND	3.51	BP-SS-FLD-015 (0.5-2)	5.3E+00	5.3E+00	5
Semi-Volatile Organic Compounds											
Benzo(a)anthracene	56553	C	134	46	12	ND	0.49	BP-SS-FLD-008 (2-4)	3.9E+00	3.9E+00	2
Benzo(a)pyrene	50328	C	134	32	11	ND	0.39	BP-SS-FLD-008 (2-4)	3.9E-01	3.9E-01	14
Benzo(b)fluoranthene	205992	C	134	33	8.2	ND	0.87	BP-SS-FLD-008 (2-4)	3.9E+00	3.9E+00	1
Dibenzo(a,h)anthracene	53703	C	134	7	1.8	ND	0.28	BP-SS-FLD-008 (2-4)	3.9E-01	3.9E-01	2
Indeno(1,2,3-cd)pyrene	193395	C	134	26	7.4	ND	0.42	BP-SS-FLD-008 (2-4)	3.9E+00	3.9E+00	1
Naphthalene	91203	N	134	63	2,300	ND	92.1	BP-GW-FLD-MW9 (2.0-4.0)	2.0E+04	2.0E+03	1
Polychlorinated Biphenyls											
Arochlor 1242	53469219	C	134	9	5.2	ND	2.3	BP-SS-FLD-022 (2-4)	1.4E+00	1.4E+00	5
Arochlor 1248	12672296	C	134	11	39	ND	8.47	BP-GW-FLD-MW9 (2.0-4.0)	1.4E+00	1.4E+00	5
Arochlor 1254	11097691	C	134	22	250	ND	19.79	106/FLD-017 (6-8') dup	1.4E+00	1.4E+00	15
Arochlor 1260	11096825	C	134	97	92	ND	11.6	BP-SS-FLD-024(4-6')	1.4E+00	1.4E+00	69
Metals											
Arsenic	7440382	C	134	134	84.8	5.4	18.18	BP-SS-FLD-017(6-8)	1.9E+00	1.9E+00	134
Iron	7439896	N	134	134	117,000	9,660	47,308.75	BP-SS-FLD-034(6-8)	3.1E+05	3.1E+04	97
Lead	7439921	—	134	134	2,020	8.6	165.21	BP-SS-FLD-002(2-4)	400 (OSWER)	400 (OSWER)	18
Manganese	7439965	N	134	134	2,830	159	1,073.90	BP-SS-FLD-007 (8-10)	2.0E+04	2.0E+03	7

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would slightly but not significantly, increase the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 4
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY SUBSURFACE SOILS
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration mg/kg	Minimum Concentration mg/kg	Average Concentration[1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Residential Soils (mg/kg)	Screening Criteria SC [2,3] (mg/kg)	Number of Times Detected Above SC
SUBSURFACE SOILS (>0.5 feet)											
Semi-Volatile Organic Compounds											
Benzo(a)anthracene	56553	C	26	5	1.2	ND	0.385	BP-SS-FLD-71 (2-4)	8.7E-01	8.7E-01	1
Benzo(a)pyrene	50328	C	26	5	1.2	ND	0.394	BP-SS-FLD-71 (2-4)	8.7E-02	8.7E-02	4
Benzo(b)fluoranthene	205992	C	26	5	1.8	ND	0.628	BP-SS-FLD-71 (2-4)	8.7E-01	8.7E-01	1
Dibenzo(a,h)anthracene	53703	C	26	1	0.13	ND	0.13	BP-SS-FLD-71 (2-4)	8.7E-02	8.7E-02	1
Polychlorinated Biphenyls											
Arochlor 1254	11097691	C	32	17	140	ND	13.78	BP-GW-FLD-MW10 (8-10)	3.2E-01/ 1.56E+00	1.56E-01	17
Arochlor 1260	11096825	C	32	13	3.7	ND	0.9	BP-SS-FLD-116	3.2E-01	3.2E-01	6
Metals											
Aluminum	7429905	N	22	22	14,300	7,410	9,885	BP-GW-FLD-MW12 (2-4)	7.8E+04	7.8E+03	20
Arsenic	7440382	C	22	22	44.1	7.3	13.3	BP-SS-FLD-71(2-4)	4.3E-01	4.3E-01	22
Iron	7439896	N	22	22	99,100	30,300	49,500	BP-SS-BKG-004 (6-8)	2.3E+04	2.3E+03	22
Manganese	7439965	N	22	22	2,980	304	1,191	BP-SS-FLD-74 (8-10)	1.6E+03	1.6E+02	22
Vanadium	7440622	N	22	22	37.5	17.6	25.9	BP-SS-FLD-74 (8-10)	7.8E+01	7.8E+00	22

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would slightly but not significantly, increase the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 5
SUMMARY OF DETECTED COMPOUNDS IN LNAPL
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

Sample ID: / Date Collected:		MW-1 PRODUCT 1/29/2001 (Phase 1)		MW-4 PRODUCT 1/29/2001 (Phase 1)	
Volatile Organic Compounds	**Units**		**VQ**		**VQ**
Acetone	mg/kg	<10		0.98	J
Benzene	mg/kg	0.8		1.7	
Chloroethane	mg/kg	2.7		<5	
Xylenes (total)	mg/kg	3.9		<2.5	
Semivolatile Organic Compounds					
Acenaphthene	mg/kg	20,000		19,000	
Acenaphthylene	mg/kg	15,000		<100000	
Anthracene	mg/kg	15,000		<100000	
Benzo(a)anthracene	mg/kg	11,000	J	7,500	J
Chrysene	mg/kg	18,000	J	12,000	J
Dibenzofuran	mg/kg	21,000		<100000	
1,4-Dichlorobenzene	mg/kg	150,000		84,000	
Fluoranthene	mg/kg	22,000		15,000	
Fluorene	mg/kg	45,000		41,000	
Isophorone	mg/kg	26,000		<100000	
2-Methylnaphthalene	mg/kg	440,000		<100000	
Naphthalene	mg/kg	59,000		<100000	
Phenanthrene	mg/kg	110,000		20,000	
Pyrene	mg/kg	21,000	J	17,000	J
PCBs					
Aroclor 1254	mg/kg	15000		<20	
Aroclor 1260	mg/kg	<1000		190	
Metals					
Aluminum	mg/kg	15.4		8.8	
Antimony	mg/kg	0.19	B	0.22	B
Arsenic	mg/kg	3.2		2.4	
Barium	mg/kg	315		47.7	
Beryllium	mg/kg	<0.50		<0.50	
Cadmium	mg/kg	0.094		<0.50	
Calcium	mg/kg	164		100	
Chromium	mg/kg	3.9		0.44	
Cobalt	mg/kg	<5.0		<5.0	
Copper	mg/kg	15.8		1.3	
Iron	mg/kg	268		56.5	
Lead	mg/kg	98.0		9.2	
Magnesium	mg/kg	5.3		19.9	
Manganese	mg/kg	18.1		1.8	
Mercury	mg/kg	<0.033		<0.033	
Nickel	mg/kg	0.89		<4.0	
Potassium	mg/kg	<500		<500	
Selenium	mg/kg	0.49	B	<0.50	
Silver	mg/kg	<1.0		<1.0	
Sodium	mg/kg	27.4		63	
Thallium	mg/kg	<1.0		<1.0	
Vanadium	mg/kg	2.1		0.73	
Zinc	mg/kg	1.7		1.0	

Notes:

B Detected in Blank
J Estimated Value
LQ = Laboratory Qualifier
VQ = Validation Qualifier

TABLE 6
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY GROUNDWATER (ALLUVIAL WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
ONSITE ALLUVIAL WELLS											
Volatile Organic Compounds											
Acetone	67641	N	30	18	4,300	ND	608.0	BP-FLD-MW2	5.5E+03	5.5E+02	5
Benzene	71432	C	30	24	2,600	ND	630.7	BP-GW-FLD-MW8	3.4E-01	3.4E-01	23
Chlorobenzene	108907	N	30	10	25	ND	7.4	BP-GW-FLD-MW1	1.1E+02	1.1E+01	1
Chloroethane	75003	C	30	27	23,000	ND	2006.5	BP-FLD-MW2	3.6E+00	3.6E+00	24
Chloroform	67663	C	30	2	15	ND	10.0	BP-GW-FLD-MW5	1.5E-01	1.5E-01	2
1,1-Dichloroethane	75343	N	30	28	6,400	ND	807.3	BP-GW-FLD-MW2	8.0E+02	8.0E+01	18
1,2-Dichloroethane	107062	C	30	4	11	ND	4.5	BP-GW-FLD-MW2	1.2E-01	1.2E-01	4
1,1-Dichloroethene	75354	N	30	13	350	ND	68.7	BP-FLD-MW9	3.5E+02	3.5E+01	3
1,2-Dichloroethene (total)	540590	N	30	18	13,000	ND	1581.3	BP-FLD-MW9	5.5E+01	5.5E+00	13
1,2-Dichloropropane	78875	C	30	1	2	ND	2.0	BP-GW-FLD-MW5	1.6E-01	1.6E-01	1
Ethylbenzene	100414	N	30	12	330	ND	62.9	BP-GW-FLD-MW8	1.3E+03	1.3E+02	2
Methylene chloride	75092	C	30	10	720	ND	127.0	BP-GW-FLD-MW8	4.1E+00	4.1E+00	9
Tetrachloroethene	127184	C	30	2	3.5	ND	2.2	BP-GW-FLD-MW5	1.0E-01	1.0E-01	2
Toluene	108883	N	30	10	4,600	ND	849.5	BP-GW-FLD-MW8	7.5E+02	7.5E+01	2
1,1,1-Trichloroethane	71556	N	30	17	960	ND	273.0	BP-GW-FLD-MW5	3.2E+03	3.2E+02	6
1,1,2-Trichloroethane	79005	C	30	7	6.5	ND	3.0	BP-GW-FLD-MW9	1.9E-01	1.9E-01	7
Trichloroethene	79016	C	30	13	250	ND	41.8	BP-GW-FLD-MW5	2.6E-02	2.6E-02	12
Vinyl chloride	75014	C	30	19	4,900	ND	591.2	BP-GW-FLD-MW9	1.5E-02	1.5E-02	19
Xylenes (total)	1330207	N	30	10	1,200	ND	258.3	BP-FLD-MW8	2.1E+02	2.1E+01	5
Semi-Volatile Organic Compounds											
Acenaphthene	83329	N	29	4	1,300	ND	333.5	BP-GW-FLD-MW1	3.7E+02	3.7E+01	1
Anthracene	120127	N	29	2	1,000	ND	511.5	BP-GW-FLD-MW1	1.8E+03	1.8E+02	1
Benzo(a)anthracene	56553	C	29	2	22	ND	12.7	BP-GW-FLD-MW2	9.2E-02	9.2E-02	2
Benzo(k)fluoranthene	207089	C	29	1	4.2	ND	4.2	BP-FLD-MW2	9.2E-01	9.2E-01	1
bis(2-Ethylhexyl) phthalate	117817	C	29	14	2,900	ND	229.8	BP-GW-FLD-MW1	4.8E+00	4.8E+00	12
Chrysene	218019	C	29	2	35	ND	26.5	BP-GW-FLD-MW2	9.2E+00	9.2E+00	2
Dibenz(a,h)anthracene	53703	C	29	2	52	ND	27.8	BP-FLD-MW1	9.2E-03	9.2E-03	2
Dibenzofuran	132649	N	29	2	1,400	ND	720.0	BP-GW-FLD-MW1	1.2E+01	1.2E+00	2
1,2-Dichlorobenzene	95501	N	29	13	1,100	ND	90.3	BP-GW-FLD-MW1	2.7E+02	2.7E+01	1
1,3-Dichlorobenzene	541731	N	29	14	2,000	ND	162.0	BP-GW-FLD-MW1	1.8E+02	1.8E+01	3
1,4-Dichlorobenzene	106467	C	29	15	11,000	ND	794.3	BP-GW-FLD-MW1	4.7E-01	4.7E-01	15
3,3'-Dichlorobenzidine	91941	C	29	5	280	ND	94.0	BP-FLD-MW1	1.5E-01	1.5E-01	5
2,4-Dichlorophenol	120832	N	29	1	880	ND	880.0	BP-GW-FLD-MW1	1.1E+02	1.1E+01	1
2,4-Dimethylphenol	105679	N	29	9	230	ND	62.8	BP-GW-FLD-MW8	7.3E+02	7.3E+01	3
Fluoranthene	206440	N	29	2	2,400	ND	1243.0	BP-GW-FLD-MW1	1.5E+03	1.5E+02	1
Fluorene	86737	N	29	5	3,200	ND	661.0	BP-GW-FLD-MW1	2.4E+02	2.4E+01	2
Hexachlorobenzene	118741	C	29	2	88	ND	48.7	BP-FLD-MW1	4.2E-02	4.2E-02	2
Hexachlorocyclopentadiene	77474	N	29	1	2,000	ND	2000.0	BP-GW-FLD-MW2	2.2E+02	2.2E+01	1
2-Methylnaphthalene	91576	N	29	7	40,000	ND	5739.8	BP-GW-FLD-MW1	2.4E+01	2.4E+00	3
2-Methylphenol	95487	N	29	7	770	ND	218.1	BP-FLD-MW1	1.8E+03	1.8E+02	2
4-Methylphenol	106445	N	29	7	48	ND	28.0	BP-GW-FLD-MW9	1.8E+02	1.8E+01	4
Naphthalene	91203	N	29	12	5,600	ND	1049.2	BP-GW-FLD-MW1	6.5E+00	6.5E-01	12

TABLE 6
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY GROUNDWATER (ALLUVIAL WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration[1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC[2,3] (µg/L)	Number of Times Detected Above SC
Semi-Volatile Organic Compounds (cont.)											
2-Nitroaniline	88744	N	29	3	220	ND	216.7	BP-FLD-MW2	1.1E+02	1.1E+01	3
Pentachlorophenol	87865	C	29	1	1.9	ND	1.9	BP-GW-FLD-MW9	5.6E-01	5.6E-01	1
Phenanthrene	85018	N	29	4	7,500.0	ND	1941.97	BP-GW-FLD-MW1	1.8E+03	1.8E+02	2
Pyrene	129000	N	29	5	1,500	ND	379.8	BP-GW-FLD-MW1	1.8E+02	1.8E+01	5
1,2,4-Trichlorobenzene	120821	N	29	8	1,800	ND	252.9	BP-GW-FLD-MW1	7.2E+00	7.2E-01	8
2,4,6-Trichlorophenol	88062	C	29	2	45	ND	25.8	BP-FLD-MW2	6.1E+00	6.1E+00	2
Polychlorinated Biphenyls											
Arochlor 1254	11097691	C	29	7	280,000	ND	43816.5	BP-GW-FLD-MW1	3.3E-02	3.3E-02	6
Arochlor 1260	11096825	C	29	3	3.8	ND	1.8	BP-FLD-MW4	3.3E-02	3.3E-02	3
Metals											
Aluminum	7429905	N	29	25	110,000	ND	9,293.5	Filtered BP-GW-FLD-MW1	3.7E+04	3.7E+03	6
Arsenic	7440382	C	29	26	527	ND	63.8	BP-GW-FLD-MW2	4.5E-02	4.5E-02	26
Barium	7440393	N	29	29	764	28.3	276.2	BP-GW-FLD-MW2	2.6E+03	2.6E+02	12
Copper	7440508	N	29	12	189	ND	35.2	Filtered BP-GW-FLD-MW1	1.5E+03	1.5E+02	1
Iron	7439896	N	29	28	136,000	ND	22,047.9	Filtered BP-GW-FLD-MW1	1.1E+04	1.1E+03	26
Lead	7439921	---	29	16	127	ND	26.7	Filtered BP-GW-FLD-MW1	1.5E+01	1.5E+01	6
Manganese	7439965	N	29	29	26,300	680	6,682.8	BP-FLD-MW5	7.3E+02	7.3E+01	29
Nickel	7440020	N	29	15	116	ND	25.3	Filtered BP-GW-FLD-MW1	7.3E+02	7.3E+01	1
Vanadium	7440622	N	29	13	193	ND	34.1	Filtered BP-GW-FLD-MW1	3.7E+01	3.7E+00	13
Mercury (4)	7439976	N	29	8	0.55	ND	0.2	Filtered BP-GW-FLD-MW1	3.7E+00	3.7E-01	1

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III.
According to EPA's estimates, inclusion of Cr as Cr VI would increase the total HI by approximately 0.8 (adult) and 2 (child). Only EPA evaluated this pathway.
(4) Methyl Mercury RBC used as a surrogate
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 7
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY GROUNDWATER (BEDROCK WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
ONSITE BEDROCK WELLS											
Volatile Organic Compounds											
Benzene	71432	C	9	6	230	ND	89.3	BP-GW-FLD-MW6B/251	3.4E-01	3.4E-01	6
Chloroethane	75003	C	9	5	180	ND	105.8	BP-FLD-MW6B	3.6E+00	3.6E+00	5
Chloroform	67663	C	9	1	0.52	ND	0.52	MW-5B	1.5E-01	1.5E-01	1
1,1-Dichloroethane	75343	N	9	9	1,100	51	441.9	BP-GW-FLD-MW6B/251	8.0E+02	8.0E+01	7
1,2-Dichloroethane	107062	C	9	3	6.4	ND	3.7	BP-GW-FLD-MW1B	1.2E-01	1.2E-01	3
1,1-Dichloroethene	75354	N	9	9	63	5.8	28.1	BP-FLD-MW5B	3.5E+02	3.5E+01	2
1,2-Dichloroethene (total)	540590	N	9	8	195	ND	48.5	BP-GW-FLD-MW6B/251	5.5E+01	5.5E+00	5
Methylene Chloride	75092	C	9	4	125	ND	35.7	BP-GW-FLD-MW6B/251	4.1E+00	4.1E+00	2
1,1,1-Trichloroethane	71556	N	9	9	960	44	407.7	BP-FLD-MW6B	3.2E+03	3.2E+02	4
1,1,2-Trichloroethane	79005	C	9	2	2.5	ND	1.7	MW-5B	1.9E-01	1.9E-01	2
Trichloroethene	79016	C	9	2	0.99	ND	0.8	MW-5B	2.6E-02	2.6E-02	2
Vinyl Chloride	75014	C	9	5	190	ND	92.8	BP-GW-FLD-MW6B/251	1.5E-02	1.5E-02	5
Polychlorinated Biphenyls											
Arochlor 1254	11097691	C	9	1	0.24	ND	0.24	BP-GW-FLD-MW1B	3.3E-02	3.3E-02	1
Metals											
Arsenic	7440382	C	9	6	22.6	ND	9.0	MW-5B	4.5E-02	4.5E-02	6
Barium	7440393	N	9	9	291	147	195.3	BP-GW-FLD-MW6B	2.6E+03	2.6E+02	1
Iron	7439896	N	9	8	1,750	ND	602.7	BP-FLD-MW5B	1.1E+04	1.1E+03	1
Manganese	7439965	N	9	9	2,070	119	901.6	BP-GW-FLD-MW1B	7.3E+02	7.3E+01	9
Vanadium	7440622	N	9	3	5.4	ND	3.6	MW-1B dup/BP-GW-FLD-MW102	3.7E+01	3.7E+00	2

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular
ND = Not Detected Above Reporting Limit

TABLE 8
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY GROUNDWATER (ALLUVIAL WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
OFFSITE ALLUVIAL WELLS											
Volatile Organic Compounds											
Acetone	67641	N	17	9	1,700	ND	241.8	BP-GW-FLD-MW10	5 5E+03	5.5E+02	1
Benzene	71432	C	17	8	89	ND	37.9	BP-GW-FLD-MW17	3.4E-01	3.4E-01	8
Chloroethane	75003	C	17	13	3,100	ND	618.1	BP-GW-FLD-MW13	3.6E+00	3.6E+00	13
1,1-Dichloroethane	75343	N	17	15	7,200	ND	1346.2	BP-GW-FLD-MW13	8.0E+02	8.0E+01	13
1,2-Dichloroethane	107062	C	17	5	100	ND	37.9	BP-GW-FLD-MW13	1.2E-01	1.2E-01	5
1,1-Dichloroethene	75354	N	17	13	1,300	ND	187.9	BP-GW-FLD-MW13	3.5E+02	3.5E+01	8
1,2-Dichloroethene (total)	540590	N	17	13	2,100	ND	505.3	BP-GW-FLD-MW15	5.5E+01	5.5E+00	12
Methylene chloride	75092	C	17	10	690	ND	192.3	BP-GW-FLD-MW13	4.1E+00	4.1E+00	10
1,1,1-Trichloroethane	71556	N	17	15	11,000	ND	2058 8	BP-GW-FLD-MW13	3.2E+03	3.2E+02	10
1,1,2-Trichloroethane	79005	C	17	7	160	ND	56.9	BP-GW-FLD-MW13	1.9E-01	1.9E-01	7
Trichloroethene	79016	C	17	9	170	ND	79.7	BP-GW-FLD-MW13	2.6E-02	2.6E-02	9
Vinyl chloride	75014	C	17	9	150	ND	56.7	BP-GW-FLD-MW17	1.5E-02	1.5E-02	9
Xylenes (total)	1330207	N	17	1	123 5	ND	123.5	BP-FLD-MW10/104	2.1E+02	2.1E+01	1
Semi-Volatile Organic Compounds											
bis(2-Ethylhexyl) phthalate	117817	C	13	8	16.5	ND	8.2	BP-GW-FLD-MW11/101	4.8E+00	4.8E+00	8
Naphthalene	91203	C	13	2	11	ND	7.0	BP-GW-FLD-MW10	6.5E+00	6.5E+00	2
1,2,4-Trichlorobenzene	120821	N	13	1	1.6	ND	1.6	BP-GW-FLD-MW10	7.2E+00	7 2E-01	1
Polychlorinated Biphenyl Compounds											
Arochlor 1254	11097691	C	13	10	42	ND	7.3	BP-FLD-MW10/104	3.3E-02	3.3E-02	10
Metals											
Aluminum	7429905	N	13	13	5900	89.1	2029.7	BP-GW-FLD-MW10/101F	3.7E+04	3.7E+03	4
Arsenic	7440382	C	13	8	12.2	ND	6.6	BP-GW-FLD-MW13	4.5E-02	4.5E-02	8
Iron	7439896	N	13	13	11700	270	3810.5	BP-GW-FLD-MW12	1.1E+04	1.1E+03	10
Manganese	7439965	N	13	13	3660	21.8	1315.2	BP-GW-FLD-MW12	7.3E+02	7.3E+01	11
Mercury (4)	7439976	N	13	5	0.73	ND	0.3	BP-GW-FLD-MW13	3.7E+00	3.7E-01	1

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would slightly but not significantly, increase the total risks.
(4) Methyl Mercury used as a surrogate.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 9
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY GROUNDWATER (BEDROCK WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
OFFSITE BEDROCK WELLS											
Volatile Organic Compounds											
Acetone	67641	N	21	8	1,000	ND	147.5	BP-GW-FLD-MW15B	5.5E+03	5.5E+02	1
Benzene	71432	C	21	4	280	ND	132.6	BP-GW-FLD-MW15B	3.4E-01	3.4E-01	3
Chloroethane	75003	C	21	9	260	ND	80.5	BP-FLD-MW15B	3.6E+00	3.6E+00	7
1,1-Dichloroethane	75343	N	21	15	3,500	ND	720.6	BP-GW-FLD-MW18B	8.0E+02	8.0E+01	10
1,2-Dichloroethane	107062	C	21	1	2.3	ND	2.3	BP-GW-FLD-MW13B	1.2E-01	1.2E-01	1
1,1-Dichloroethene	75354	N	21	10	110	ND	34.0	BP-GW-FLD-MW15B	3.5E+02	3.5E+01	4
1,2-Dichloroethene (total)	540590	N	21	9	270	ND	63.6	BP-GW-FLD-MW15B	5.5E+01	5.5E+00	5
Methylene Chloride	75092	C	21	10	300	ND	55.1	BP-GW-FLD-MW15B	4.1E+00	4.1E+00	5
1,1,1-Trichloroethane	71556	N	21	14	3,600	ND	806.8	BP-FLD-MW15B	3.2E+03	3.2E+02	7
1,1,2-Trichloroethane	79005	C	21	3	1.7	ND	0.79	BP-GW-FLD-MW13B	1.9E-01	1.9E-01	3
Trichloroethene	79016	C	21	1	0.35	ND	0.35	BP-GW-FLD-MW17B	2.6E-02	2.6E-02	1
Vinyl Chloride	75014	C	21	5	220	ND	96.5	BP-GW-FLD-MW15B	1.5E-02	1.5E-02	5
Semi-Volatile Organic Compounds											
bis(2-Ethylhexyl) phthalate	117817	C	14	7	9	ND	4.9	BP-FLD-MW13B	4.8E+00	4.8E+00	7
Metals											
Antimony	7440360	N	14	1	76.2	ND	76.2	BP-GW-FLD-MW17BF	1.5E+01	1.5E+00	1
Arsenic	7440382	C	14	5	289	ND	64.6	BP-GW-FLD-MW17BF	4.5E-02	4.5E-02	5
Barium	7440393	N	14	14	2,580	62.3	548.50	BP-FLD-MW14B	2.6E+03	2.6E+02	7
Iron	7439896	N	14	10	1,630	ND	427.8	BP-GW-FLD-MW15B	1.1E+04	1.1E+03	2
Manganese	7439965	N	14	14	3,040	19 8	579.90	BP-GW-FLD-MW18BF	7.3E+02	7.3E+01	11
Vanadium	7440622	N	14	6	8.3	ND	5.2	BP-GW-FLD-MW18BF	3.7E+01	3.7E+00	6

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. For carcinogenic chemicals the values correspond to a lifetime cancer risk of 1E-6,
while the noncarcinogenic chemicals are at a hazard quotient of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 10
SUMMARY OF CHEMICALS OF INTEREST - INHALATION
FOR ON-FACILITY GROUNDWATER (ALLUVIAL WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	PADEP Nonresidential Volatilization to Indoor Air Adjusted [3]	Number of Times Detected Above SC
ONSITE ALLUVIAL WELLS									
Volatile Organic Compounds									
Acetone	67641	30	18	4,300	ND	608.0	BP-FLD-MW2	NOC	0
Benzene	**71432**	**30**	**24**	**2,600**	**ND**	**630.7**	**BP-GW-FLD-MW8**	**590**	**8**
Chlorobenzene	108907	30	10	25	ND	7.4	BP-GW-FLD-MW1	3,800	0
Chloroethane	**75003**	**30**	**27**	**23,000**	**ND**	**2006.5**	**BP-FLD-MW2**	**3,700**	**4**
Chloroform	67663	30	2	15	ND	10.0	BP-GW-FLD-MW5	58	0
1,1-Dichloroethane	**75343**	**30**	**28**	**6,400**	**ND**	**807.3**	**BP-GW-FLD-MW2**	**2,600**	**4**
1,2-Dichloroethane	107062	30	4	11	ND	4.5	BP-GW-FLD-MW2	460	0
1,1-Dichloroethene	75354	30	13	350	ND	68.7	BP-FLD-MW9	22,000	0
1,2-Dichloroethene (total)	**540590**	**30**	**18**	**13,000**	**ND**	**1581.3**	**BP-FLD-MW9**	**5,900**	**2**
1,2-Dichloropropane	78875	30	1	2	ND	2.0	BP-GW-FLD-MW5	650	0
Ethylbenzene	100414	30	12	330	ND	62.9	BP-GW-FLD-MW8	4,500	0
Methylene chloride	75092	30	10	720	ND	127 0	BP-GW-FLD-MW8	13,000	0
Tetrachloroethene	127184	30	2	3.5	ND	2.2	BP-GW-FLD-MW5	7,000	0
Toluene	108883	30	10	4,600	ND	849.5	BP-GW-FLD-MW8	NOC	0
1,1,1-Trichloroethane	71556	30	17	960	ND	273 0	BP-GW-FLD-MW5	NOC	0
1,1,2-Trichloroethane	79005	30	7	6.5	ND	3.0	BP-GW-FLD-MW9	900	0
Trichloroethene	79016	30	13	250	ND	41.8	BP-GW-FLD-MW5	2,400	0
Vinyl chloride	**75014**	**30**	**19**	**4,900**	**ND**	**591.2**	**BP-GW-FLD-MW9**	**300**	**4**
Xylenes (total)	1330207	30	10	1,200	ND	258.3	BP-FLD-MW8	NOC	0

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on *PADEP Nonresidential Volatilization to Indoor Air Screening Value (DEP, 2004).*
(3) Criteria was adjusted from a cancer risk of 1 x 10-5 to 1 x 10-6 and from an HI of 1 to 0.1.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular
ND = Not Detected Above Reporting Limit
NOC = Not of concern, value above constiuent water solubility

TABLE 11
SUMMARY OF CHEMICALS OF INTEREST -INHALATION
FOR OFF-FACILITY GROUNDWATER (ALLUVIAL WELLS)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	PADEP Residential Volatilization to Indoor Air Adjusted[2]	Number of Times Detected Above SC[3]
OFFSITE ALLUVIAL WELLS									
Volatile Organic Compounds									
Acetone	67641	17	9	1,700	ND	241.8	BP-GW-FLD-MW10	NOC	0
Benzene	71432	17	8	89	ND	37.9	BP-GW-FLD-MW17	350	0
Chloroethane	**75003**	**17**	**13**	**3,100**	**ND**	**618.1**	**BP-GW-FLD-MW13**	**2,200**	**4**
1,1-Dichloroethane	75343	17	15	7,200	ND	1346.2	BP-GW-FLD-MW13	16,000	0
1,2-Dichloroethane	107062	17	5	100	ND	37.9	BP-GW-FLD-MW13	280	0
1,1-Dichloroethene	75354	17	13	1,300	ND	187.9	BP-GW-FLD-MW13	16,000	0
1,2-Dichloroethene (total)	540590	17	13	2,100	ND	505.3	BP-GW-FLD-MW15	4,200	0
Methylene chloride	75092	17	10	690	ND	192.3	BP-GW-FLD-MW13	7,700	0
1,1,1-Trichloroethane	71556	17	15	11,000	ND	2058.8	BP-GW-FLD-MW13	NOC	0
1,1,2-Trichloroethane	79005	17	7	160	ND	56.9	BP-GW-FLD-MW13	540	0
Trichloroethene	79016	17	9	170	ND	79.7	BP-GW-FLD-MW13	1,400	0
Vinyl chloride	75014	17	9	150	ND	56.7	BP-GW-FLD-MW17	180	0
Xylenes (total)	1330207	17	1	123.5	ND	123.5	BP-FLD-MW10/104	13,000	0

Notes:
(1) Calculated from detected concentrations only.
(2) Criteria was adjusted from a cancer risk of 1 x 10-5 to 1 x 10-6 and from an HI of 1 to 0.1.
(3) The Screening Criteria are based on PADEP Residential Volatilization to Indoor Air Screening Value (DEP, 2004).
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit
NOC = Not of concern, value above constiuent water solubility

TABLE 12
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY WETLAND SURFACE WATER
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
ONSITE WETLAND SURFACE WATER											
Polychlorinated Biphenyls											
Arochlor 1260	11096825	C	4	1	1.2	ND	1.2	SW-WET-001	3.3E-02	3.3E-01	1
Semivolatile Organic Compounds											
Bis(2-ethylhexyl)phthalate	117817	C	4	2	85	ND	56.5	SW-WET-002	4.8E+00	4.8E+01	1
Metals											
Arsenic	7440382	C	4	4	9	5 9	7.03	SW-WET-001	4.5E-02	4.5E-01	4
Lead	7439921	—	4	4	55.3	8.7	30.7	SW-WET-001	15 (Action Level)	15 (Action Level)	2
Manganese	7439965	N	4	4	8,620	5,150	6,436.7	SW-WET-003	7.3E+02	7.3E+02	4

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. Surface water samples are screened against the Tap Water RBCs x 10
The noncarcinogenic chemicals are screened against the 1/10 Tap Water RBCs to correspond to an HI of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular
ND = Not Detected Above Reporting Limit

TABLE 13
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY SURFACE WATER (MONTOUR RUN)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration µg/L	Minimum Concentration µg/L	Average Concentration [1] µg/L	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Tap Water (µg/L)	Screening Criteria SC [2,3] (µg/L)	Number of Times Detected Above SC
OFFSITE SURFACE WATER (Montour Run)											
Semivolatile Polychlorinated Biphenyls											
Bis(2-ethylhexyl)phthalate	117817	C	25	14	70	ND	19.43	SW-MR-005	4.8E+00	4.8E+01	2
Metals											
Manganese	7439965	N	25	24	5500	ND	524.8	SW-MR-001F	7.3E+02	7.3E+02	3

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. Surface water samples are screened against the Tap Water RBCs x 10.
The noncarcinogenic chemicals are screened against the 1/10 Tap Water RBCs to correspond to an HI of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 14
SUMMARY OF CHEMICALS OF INTEREST
FOR ON-FACILITY WETLAND SEDIMENT SAMPLES
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration (mg/kg)	Minimum Concentration (mg/kg)	Average Concentration [1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Residential Soils (mg/kg)	Screening Criteria SC [2,3] (mg/kg)	Number of Times Detected Above SC
ONSITE WETLAND SEDIMENT											
Dioxin/Furans											
2,3,7,8-Tetrachlorodibenzodioxin (TEQ)	1746016	C	1	1	59.432 pg/g (EPA) 57.475 pg/g (WHO)	---- ----	----	BP-SD-WET-001	4.3 pg/g	43 pg/g	1
Polychlorinated Biphenyls											
Arochlor 1260	11096825	C	4	4	26	0.5	7.7	SD-WET-001	3.2E-01	3.2E+00	4
Metals											
Arsenic	7440382	C	4	4	10.7	5.8	7.9	SD-WET-001	4.6E-01	4.3E+00	4
Iron	7439896	N	4	4	33,400	23,200	27,300	SD-WET-003	2.3E+04	2.3E+04	3
Lead	7139921	----	4	4	435	29.8	159.5	SD-WET-001	400 (OSWER)	400 (OSWER)	1

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. Sediment samples are screened against the residential soil RBCs x 10.
The noncarcinogenic chemicals are screened against the 1/10 the Residential RBC to correspond to an HI of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular Compound
ND = Not Detected Above Reporting Limit

TABLE 15
SUMMARY OF CHEMICALS OF INTEREST
FOR OFF-FACILITY SEDIMENT (MONTOUR RUN)
BRESLUBE PENN SUPERFUND SITE
Coraopolis, Pennsylvania

CHEMICALS OF INTEREST	CAS Number	Chemical Type	Number of Samples Collected	Number of Times Detected above RL	Maximum Concentration mg/kg	Minimum Concentration mg/kg	Average Concentration[1] mg/kg	Location of Maximum Concentration	USEPA Region 3 Risk Based Concentration Residential Soils (mg/kg)	Screening Criteria SC[2,3] (mg/kg)	Number of Times Detected Above SC
OFFSITE SEDIMENT (MONTOUR RUN)											
Metals (mg/kg)											
Arsenic	7440382	C	25	25	15.5	7	10.3	SD-MR-018	4.3E-01	4.3E+00	25
Iron	7439896	N	25	25	47,300	17,900	30,820	SD-MR-005	2.3E+04	2.3E+03	23
Manganese	7439965	N	25	25	3,880	510	1468.4	SD-MR-009	1.6E+03	1.6E+02	7

Notes:
(1) Calculated from detected concentrations only.
(2) The Screening Criteria are based on EPA Region 3 Risk Based Concentration (RBC) Tables
dated October 8, 2004. Sediment samples are screened against the residential soil RBCs x 10.
The noncarcinogenic chemicals are screened against the 1/10 the Residential RBC to correspond to an HI of 0.1 for screening purposes.
(3) Although EPA Region 3 recommends screening total chromium as Cr VI, total chromium concentrations in soils were screened as Cr III. Inclusion of Cr as Cr VI would not change the total risks.
N =Noncarcinogen
C=Carcinogen
RL = Laboratory Reporting Limit for a Particular
ND = Not Detected Above Reporting Limit

TABLE 16
EXPOSURE PATHWAYS SELECTED FOR EVALUATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-facility/ Off-facility	Type of Analysis	Rationale for Selection or Exclusion of Exposure
Current/ Future	Surface Soil	Surface Soil	Exposed Soil Locations On-Facility	Trespasser/Visitor	Adult	Inhalation	On- Facility	None	1
						Dermal Absorption	On- Facility	Quant.	2
						Ingestion	On- Facility	Quant.	2
					Child	Inhalation	On- Facility	None	1
						Dermal Absorption	On- Facility	Quant.	2
						Ingestion	On- Facility	Quant.	2
			Exposed Soil Locations Off-Facility	Recreational	Adult	Inhalation	Off-Facility	None	1
						Dermal Absorption	Off-Facility	Quant.	3
						Ingestion	Off-Facility	Quant.	3
					Child	Inhalation	Off-Facility	None	1
						Dermal Absorption	Off-Facility	Quant.	3
						Ingestion	Off-Facility	Quant.	3
	Sediment	Sediment	On-Facility Wetland	Trespasser	Adult	Dermal Absorption	On-Facility	Quant.	4
						Ingestion	On-Facility	Quant.	4
					Child	Dermal Absorption	On-Facility	Quant.	4
						Ingestion	On-Facility	Quant.	4
			Montour Run	Fisher	Adult	Dermal Absorption	Off-Facility	None	5
						Ingestion	Off-Facility	None	5
					Child	Dermal Absorption	Off-Facility	None	5
						Ingestion	Off-Facility	None	5
			Animal Tissue	Fisher	Adult	Dermal Absorption	Off-Facility	None	5
						Ingestion	Off-Facility	None	5
					Child	Dermal Absorption	Off-Facility	None	5
						Ingestion	Off-Facility	None	5
	Surface Water	Surface Water	On-Facility Wetlands	Trespasser/Visitor	Adult	Dermal Absorption	On- Facility	Quant.	6
						Ingestion	On- Facility	Quant.	6
					Child	Dermal Absorption	On- Facility	Quant.	6
						Ingestion	On- Facility	Quant.	6
			Montour Run	Fisher	Adult	Dermal	Off-Facility	None	5
						Ingestion	Off-Facility	None	5
					Child	Dermal Absorption	Off-Facility	None	5
						Ingestion	Off-Facility	None	5

TABLE 16
EXPOSURE PATHWAYS SELECTED FOR EVALUATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-facility/ Off-facility	Type of Analysis	Rationale for Selection or Exclusion of Exposure
Future	Surface Soil	Surface Soil	Exposed Soil Locations On-Facility	Industrial Worker	Adult	Inhalation	On- Facility	None	1
						Dermal Absorption	On- Facility	Quant.	7
						Ingestion	On- Facility	Quant.	7
				Construction Worker	Adult	Inhalation	On- Facility	None	1
						Dermal Absorption	On- Facility	Quant.	8
						Ingestion	On- Facility	Quant.	8
				Construction Worker	Adult	Inhalation	Off-Facility	None	1
						Dermal Absorption	Off-Facility	Quant.	8
						Ingestion	Off-Facility	Quant.	8
	Subsurface Soil	Subsurface Soil	Vapor Migration via volatilization from subsurface soils	Industrial Worker	Adult	Inhalation	On- Facility	None	9
			Exposed Subsurface Soils during Trenching	Construction Worker	Adult	Inhalation	On- Facility	None	9
						Dermal Absorption	On- Facility	Quant.	8
						Ingestion	On- Facility	Quant.	8
			Exposed Off-Facility Subsurface Soils During Trenching	Construction Worker	Adult	Inhalation	Off-Facility	None	9
						Dermal Absorption	Off-Facility	Quant.	8
						Ingestion	Off-Facility	Quant.	8
Current/Future	Groundwater	Groundwater	On-Facility Shallow Aquifer	Trespasser/Visitor	Adult	Dermal Absorption	On- Facility	None	10
						Ingestion	On- Facility	None	10
						Inhalation	On- Facility	Quant.	11
					Child	Dermal Absorption	On- Facility	None	10
						Ingestion	On- Facility	None	10
						Inhalation	On- Facility	Quant.	11
				Industrial Worker	Adult	Dermal Absorption	On- Facility	None	10
						Ingestion	On- Facility	None	10
						Inhalation	On- Facility	Quant.	11
				Construction Worker	Adult	Dermal Absorption	On- Facility	Quant.	10
						Ingestion	On- Facility	Quant.	10
						Inhalation	On- Facility	Quant.	11

TABLE 16
EXPOSURE PATHWAYS SELECTED FOR EVALUATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-facility/ Off-facility	Type of Analysis	Rationale for Selection or Exclusion of Exposure
			Off-Facility Shallow Aquifer	Recreational	Adult	Dermal Absorption	Off-Facility	None	12
						Ingestion	Off-Facility	None	12
						Inhalation	On- Facility	Quant.	
					Child	Dermal Absorption	Off-Facility	None	12
						Ingestion	Off-Facility	None	12
						Inhalation	On- Facility	Quant.	
				Construction Worker	Adult	Dermal Absorption	On- Facility	None	12
						Ingestion	On- Facility	None	12
						Inhalation	On- Facility	Quant.	
				Resident	Adult	Dermal Absorption	Off-Facility	None	12
						Ingestion	Off-Facility	None	12
						Inhalation	On- Facility	None	
					Child	Dermal Absorption	Off-Facility	None	12
						Ingestion	Off-Facility	None	12
						Inhalation	On- Facility	None	
				Industrial Worker	Adult	Dermal Absorption	Off-Facility	None	12
						Ingestion	Off-Facility	None	12
						Inhalation	On- Facility	Quant.	
			Off-facility Bedrock Aquifer	Resident	Adult	Ingestion	Off-Facility	Quant.	14
						Dermal Absorption	Off-Facility	Quant.	14
						Inhalation	Off-Facility	Quant.	14
					Child	Ingestion	Off-Facility	Quant.	14
						Dermal Absorption	Off-Facility	Quant.	14

(1) No VOCs found in surface soils above the screening criteria.
(2) Trespassers can access the site through unfenced areas and contact soils.
(3) Recreational users in the vicinity of Montour Trail may contact COIs in surface soil.
(4) Trespassers can access the site through unfenced areas and contact wetland sediments.
(5) Statistical comparisons of downstream vs upstream COI data show no significant difference.
(6) Trespassers can access the site through unfenced areas and contact exposed surface water.
(7) If property is developed, on-facility workers may contact exposed soils.
(8) Construction workers may contact COIs in soils through trenching, excavation, etc.
(9) No VOCs found in subsurface soils concentrations above screening criteria.
(10) No groundwater seeps identified on-facility.
(11) COIs volatilized from go may be inhaled in outdoor air
(12) No groundwater seeps identified off-facility.
(13) No VOCs found in shallow groundwater above screening criteria.
(14) COIs in off-facility bedrock water may be ingested if intercepted by an offsit domestic well.

TABLE 17
CANCER TOXICITY DATA -- ORAL/DERMAL
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest [1]		Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal [4]	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guidance Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
7440382	Arsenic	1.50E+00	mg/kg/day-1	1	1.50E+00	mg/kg/day-1	A	IRIS	4/10/1998
71432	Benzene	5.50E-02	mg/kg/day-1	1	5.50E-02	mg/kg/day-1	A	IRIS	1/19/2000
56553	Benzo(a)anthracene	7.30E-01	mg/kg/day-1	1	7.30E-01	mg/kg/day-1	B2	NCEA	NA
50328	Benzo(a)pyrene	7.30E+00	mg/kg/day-1	1	7.30E+00	mg/kg/day-1	B2	IRIS	11/01/1994
205992	Benzo(b)fluoranthene	7.30E-01	mg/kg/day-1	1	7.30E-01	mg/kg/day-1	B2	NCEA	NA
207089	Benzo(k)fuoranthene	7.30E-02	mg/kg/day-1	1	7.30E-02	mg/kg/day-1	B2	NCEA	NA
117817	Bis(2-ethylhexyl)phthalate	1.40E-02	mg/kg/day-1	1	1.40E-02	mg/kg/day-1	B2	IRIS	2/1/1993
218019	Chrysene	7.30E-03	mg/kg/day-1	1	7.30E-03	mg/kg/day-1	B2	NCEA	NA
75003	Chloroethane	2.90E-03	mg/kg/day-1	1	2.90E-03	mg/kg/day-1	C	NCEA	NA
67663	Chloroform	See Note 2					B2		
53703	Dibenzo(a,h)anthracene	7.30E+00	mg/kg/day-1	1	7.30E+00	mg/kg/day-1	B2	NCEA	NA
106467	1,4-Dichlorobenzene	2.40E-02	mg/kg/day-1	1	2.40E-02	mg/kg/day-1	C	HEAST	NA
91941	3,3-Dichlorobenzidine	4.50E-01	mg/kg/day-1	1	4.50E-01	mg/kg/day-1	B2	IRIS	7/1/1993
107062	1,2-Dichloroethane	9.10E-02	mg/kg/day-1	1	9.10E-02	mg/kg/day-1	B2	IRIS	1/1/1991
75354	1,1 Dicloroethene	See Note 3	--	--	--	--	C	IRIS	
78875	1,2-Dichloropropane	6.80E-02	mg/kg/day-1	1	6.80E-02	mg/kg/day-1	NA	HEAST	NA
118741	Hexachlorobenzene	1.60E+00	mg/kg/day-1	1	1.60E+00	mg/kg/day-1	B2	IRIS	11/1/1996
193395	Indeno(1,2,3-cd)pyrene	7.30E-01	mg/kg/day-1	1	7.30E-01	mg/kg/day-1	B2	NCEA	NA
75092	Methylene Chloride	7.50E-03	mg/kg/day-1	1	7.50E-03	mg/kg/day-1	B2	IRIS	2/1/1995
87865	Pentachlorophenol	1.20E-01	mg/kg/day-1	1	1.20E-01	mg/kg/day-1	B2	IRIS	7/1/1993
53469219	PCB-1248 (Arochlor-1242)	2.00E+00	mg/kg/day-1	1	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
12672296	PCB-1248 (Arochlor-1248)	2.00E+00	mg/kg/day-1	1	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
11097691	PCB-1254 (Arochlor-1254)	2.00E+00	mg/kg/day-1	1	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
11096825	PCB-1260 (Arochlor-1260)	2.00E+00	mg/kg/day-1	1	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
1746016	2,3,7,8-Tetrachlorodibenzodioxin	1.50E+05	mg/kg/day-1	1	1.50E+05	mg/kg/day-1	B2	HEAST	NA
127184	Tetrachloroethene	5.40E-01	mg/kg/day-1	1	5.40E-01	mg/kg/day-1	NA	NCEA	03/01/1998
79005	1,1,2-Trichloroethane	5.70E-02	mg/kg/day-1	1	5.70E-02	mg/kg/day-1	C	IRIS	2/1/1994
79016	Trichloroethene	4.00E-01	mg/kg/day-1	1	4.00E-01	mg/kg/day-1	NA	NCEA	NA
88062	2,4,6-Trichlorophenol	1.10E-02	mg/kg/day-1	1	1.10E-02	mg/kg/day-1	B2	IRIS	NA
75014	Vinyl chloride (early life)	1.40E+00	mg/kg/day-1	1	1.40E+00	mg/kg/day-1	A	IRIS	08/07/2000
	Vinyl chloride (adult)	7.20E-01	mg/kg/day-1	1	7.20E-01	mg/kg/day-1	A	IRIS	08/07/2000

Notes:

1) Only those COCs that are classified as A, B1,B2 or C are listed on this table.

2) The RfD for noncancer effect is considered adequately protective of public health for cancer effects by the oral route, on the basis of the nonlinear dose response for chloroform *and the mode of action for both cancer and noncancer effects having a common link through cytotoxicity*

3) Not applicable. 1,1-DCE shows equivocal evidence of carcinogenicity by the oral route of exposure

4) EPA Risk Assessment Guidance for Superfund (RAGS), Volume 1 Human Health Evaluation Manual (Part E Supplemental Guidance for Dermal Risk Assessment) 2004. Described in RI report under Section 6.1.2.3.2 Exposure Dose, Dermal Exposure.

NA = Not Available

IRIS = Integrated Risk Information System (2004)

HEAST = Health Effects Assessment Summary Tables (1997)

NCEA = National Center for Environmental Assessment

TABLE 18
CANCER TOXICITY DATA -- INHALATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Unit Risk		USEPA Region 3 RBC Tables Inhalation Cancer Slope Factor		Weight of Evidence/ Cancer Guidance Description	Unit Risk: Inhalation CSF	
		Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
7440382	Arsenic	4.30E-03	$(\mu g/m^3)^{-1}$	1.51E+01	mg/kg/day-1	A	IRIS	4/10/1998
71432	Benzene	7.80E-06	$(\mu g/m^3)^{-1}$	2.70E-02	mg/kg/day-1	A	IRIS	1/19/2000
50328	Benzo(a)pyrene	--	--	3.10E+00	mg/kg/day-1	B2	NCEA	NA
117817	Bis (2-ethylhexyl)phthalate	--	--	1.40E-02	mg/kg/day-1	NA	NCEA	NA
67663	Chloroform	2.30E-05	$(\mu g/m^3)^{-1}$	8.10E-02	mg/kg/day-1	B2	IRIS	10/19/2001
7440484	Cobalt	--	--	9.80E+00	mg/kg/day-1	EPA Provisional Review		
106467	1,4-Dichlorobenzene	--	--	2.20E-02	mg/kg/day-1	NA	NCEA	NA
75354	1,1-Dichloroethene	See Note 1	--	Not Applicable	--	C	IRIS	08/13/2002
107062	1,2-Dichloroethane	2.60E-05	$(\mu g/m^3)^{-1}$	9.10E-02	mg/kg/day-1	B2	IRIS	1/1/1991
118741	Hexachlorobenzene	4.60E-04	$(\mu g/m^3)^{-1}$	1.60E+00	mg/kg/day-1	B2	IRIS	11/1/1991
75092	Methylene Chloride	4.70E-07	$(\mu g/m^3)^{-1}$	1.65E-03	mg/kg/day-1	B2	IRIS	2/1/1995
53469219	PCB-1242 (Arochlor-1242)	--	--	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
12672296	PCB-1248 (Arochlor-1248)	--	--	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
11097691	PCB-1254 (Arochlor-1254)	--	--	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
11096825	PCB-1260 (Arochlor-1260)	--	--	2.00E+00	mg/kg/day-1	B2	IRIS	6/1/1997
1746016	2,3,7,8-Tetrachlorodibenzodioxin	--	--	1.50E+05	mg/kg/day-1	NA	HEAST	NA
127184	Tetrachloroethene	5.80E-07	$(\mu g/m^3)^{-1}$	2.00E-02	mg/kg/day-1	NA	NCEA	NA
79005	1,1,2-Trichloroethane	1.60E-05	$(\mu g/m^3)^{-1}$	5.60E-02	mg/kg/day-1	C	IRIS	2/1/1994
88062	2,4,6-Trichlorophenol	3.10E-06	$(\mu g/m^3)^{-1}$	1.00E-02	mg/kg/day-1	B2	IRIS	2/1/1994
79016	Trichloroethene	1.70E-06	$(\mu g/m^3)^{-1}$	4.00E-01	mg/kg/day-1	NA	NA	NA
75014	Vinyl chloride (early life)	8.80E-06	$(\mu g/m^3)^{-1}$	3.00E-02	mg/kg/day-1	A	IRIS	08/07/2000
	Vinyl chloride (adult)	4.40E-06	$(\mu g/m^3)^{-1}$	1.50E-02	mg/kg/day-1	A	IRIS	08/07/2000

Notes:
NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Helath Effects Assessment Summary Tables (1997)
NCEA = National Center forEnvironmental Assessment

1) Not applicable. 1,1-DCE shows suggestive evidence of human carcinogenicity by the inhalation route of exposure. The weight of evidence, however, is not sufficient to justify deriving an inhalation unit risk.

TABLE 19
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[3]	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds											
67641	Acetone	Subchronic	9.00E-01	mg/kg/day	1	9.00E-01	mg/kg/day	Kidney	1000	IRIS	07/31/2003
71432	Benzene	Chronic	4.00E-03	mg/kg/day	1	4.00E-03	mg/kg/day	Decreased Lymphocyte	300	IRIS	4/17/2003
108907	Chlorobenzene	Chronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	Liver	1000	IRIS	07/01/1993
75003	Chloroethane (Ethyl Chloride)	Chronic	4.00E-01	mg/kg/day	1	4.00E-01	mg/kg/day	NA	NA	NCEA	NA
67663	Chloroform	Chronic	1.00E-02	mg/kg/day	1	1.00E-02	mg/kg/day	Liver	1000	IRIS	10/19/2001
75343	1,1-Dichloroethane	Chronic	1.00E-01	mg/kg/day	1	1.00E-01	mg/kg/day	Liver/Kidney/ Lung	NA	HEAST	NA
107062	1,2-Dichloroethane	Chronic	2.00E-02	mg/kg/day	1	2.00 E-02	mg/kg/day	Lung/Stomach	NA	NCEA	NA
75354	1,1-Dichloroethene	Chronic	5.00E-02	mg/kg/day	1	5.00E-02	mg/kg/day	Liver	100	IRIS	08/13/1992
540590	1,2-Dichloroethene (total)	Chronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	NA	1000	IRIS	1/1/1989
78875	1,2 Dichloropropane	--	NA	--	--	--	--	--	--	--	--
100414	Ethylbenzene	Subchronic	1.00E-01	mg/kg/day	1	1.00E-01	mg/kg/day	Liver/Kidney	1000	IRIS	06/01/1991
75092	Methylene Chloride (Dichloromethane)	Chronic	6.00E-02	mg/kg/day	1	6.00E-02	mg/kg/day	Liver	100	IRIS	03/01/1988
127184	Tetrachloroethene	Chronic	1.00E-02	mg/kg/day	1	1.00E-02	mg/kg/day	Liver	1000	IRIS	03/01/1998
108883	Toluene	Chronic	2.00E-01	mg/kg/day	1	2.00E-01	mg/kg/day	Liver/Kidney	1000	IRIS	04/01/1994
71556	1,1,1-Trichloroethane	Chronic	2.80E-01	mg/kg/day	1	2.80E-01	mg/kg/day	Liver	1000	NCEA (1)	
79005	1,1,2-Trichloroethane	Subchronic	4.00E-03	mg/kg/day	1	4.00E-03	mg/kg/day	Liver/Kidney	1000	IRIS	02/01/1995
79016	Trichloroethene	Chronic	3.00E-04	mg/kg/day	1	3.00E-04	mg/kg/day	Liver/Kidney	NA	NCEA	8/1/2001
75014	Vinyl chloride (early life)	Chronic	3.00E-03	mg/kg/day	1	3.00E-03	mg/kg/day	Liver	30	IRIS	08/07/2000
	Vinyl chloride (adult)	Chronic	3.00E-03	mg/kg/day	1	3.00E-03	mg/kg/day	Liver	30	IRIS	08/07/2000
1330-20-7	Xylenes	Chronic	2.00E-01	mg/kg/day	1	2.00E-01	mg/kg/day	Whole Body	1000	IRIS	2/21/2003
Semi-Volatile Compounds											
117817	bis(2-ethylhexyl)phthalate	Chronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	Liver	1000	IRIS	05/01/1991
95501	1,2-Dichlorobenzene	Chronic	9.00E-02	mg/kg/day	1	9.00E-02	mg/kg/day	NOEL (2)	1000	IRIS	03/01/1991
541731	1,3-Dichlorobenzene	Chronic	3.00E-03	mg/kg/day	1	3.00E-02	mg/kg/day	NA	NA	NCEA	NA
106467	1,4-Dichlorobenzene	Chronic	3.00E-02	mg/kg/day	1	3.00E-02	mg/kg/day	NA	NA	NCEA	NA
91941	3,3 Dichlorobenzidine	--	NA	--	--	--	--	--	--	--	--
120832	2,4-Dichlorophenol	Chronic	3.00E-03	mg/kg/day	1	3.00E-03	mg/kg/day	Spleen/Liver	100	IRIS	06/30/1988
105679	2,4-Dimethylphenol	Chronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	Kidney	3000	IRIS	11/01/1990
118741	Hexachlorobenzene	Chronic	8.00E-04	mg/kg/day	1	8.00E-04	mg/kg/day	Liver	100	IRIS	04/01/1991
77474	Hexachlorocyclopentadiene	SubChronic	6.00E-03	mg/kg/day	1	6.00E-03	mg/kg/day	GIS	1000	IRIS	07/05/2001

TABLE 19
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[3]	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
95487	2-Methylphenol	Chronic	5.00E-02	mg/kg/day	1	5.00E-02	mg/kg/day	CNS	1000	IRIS	09/01/1990
106445	4-Methylphenol	Chronic	5.00E-03	mg/kg/day	1	5.00E-03	mg/kg/day	NA	NA	HEAST	NA
88744	2-Nitroaniline	Chronic	3.00E-03	mg/kg/day	1	3.00E-03	mg/kg/day	Blood	100	NCEA (1)	NA
87865	Pentachlorophenol	Chronic	3.00E-02	mg/kg/day	1	3.00E-02	mg/kg/day	Liver/Kidney	100	IRIS	02/01/1993
120821	1,2,4-Trichlorobenzene	Chronic	1.00E-02	mg/kg/day	1	1.00E-02	mg/kg/day	Liver/Kidney	1000	IRIS	11/01/1996
88062	2,4,6 Trichlorophenol	--	NA	--	--	--	--	--	--	--	--
Polyaromatic Hydrocarbons											
83329	Acenaphthene	Chronic	6.00E-02	mg/kg/day	1	6.00E-02	mg/kg/day	Liver	3000	IRIS	04/01/1994
120127	Anthracene	Subchronic	3.00E-01	mg/kg/day	1	3.00E-01	mg/kg/day	Whole Body	3000	IRIS	07/01/1993
56553	Benzo(a)anthracene	--	NA	--	--	--	--	--	--	--	--
205992	Benzo(b)flouranthene	--	NA	--	--	--	--	--	--	--	--
207089	Benzo(k)anthracene	--	NA	--	--	--	--	--	--	--	--
50328	Benzo(a)pyrene	--	NA	--	--	--	--	--	--	--	--
218019	Chrysene	--	NA	--	--	--	--	--	--	--	--
53703	Dibenzo(a,h)anthracene	--	NA	--	--	--	--	--	--	--	--
132649	Dibenzofuran	Chronic	2.00E-03	mg/kg/day	1	2.00E-03	mg/kg/day	Kidney	3000	NCEA (1)	NA
206440	Fluoranthene	SubChronic	4.00E-02	mg/kg/day	1	4.00E-02	mg/kg/day	Liver/Kidney	3000	IRIS	07/01/1993
86737	Fluorene	SubChronic	4.00E-02	mg/kg/day	1	4.00E-02	mg/kg/day	Blood	3000	IRIS	11/01/1990
193395	Indeno(1,2,3-cd)pyrene	--	NA	--	--	--	--	--	--	--	--
91576	2-Methylnaphthalene	Chronic	4.00E-03	mg/kg/day	1	4.00E-03	mg/kg/day	CVS	1000	IRIS	12/22/2003
91203	Naphthalene	Subchronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	Body Weight	3000	IRIS	09/17/1998
129000	Pyrene	Chronic	3.00 E-02	mg/kg/day	1	3.00 E-02	mg/kg/day	Kidney	3000	IRIS	07/01/1993
Polychlorinated Biphenyls											
53469219	PCB-1242 (Arochlor-1242)	--	NA	--	--	--	--	--	--	--	--
12672296	PCB-1248 (Arochlor-1248)	--	NA	--	--	--	--	--	--	--	--
11097691	PCB-1254 (Arochlor-1254)	Chronic	2.00E-05	mg/kg/day	1	2.00E-05	mg/kg/day	ves/Immune Syste	300	IRIS	11/01/1996
11096825	PCB-1260 (Arochlor-1260)	--	NA	--	--	--	--	--	--	--	--
Dioxans/Furans											
1746016	2,3,7,8 Tetrachlorodibenzodioxin (TEQ)	--	NA	--	--	--	--	--	--	--	--
Metals											
7429905	Aluminum	Chronic	1.00E+00	mg/kg/day	1	1.00E+00	mg/kg/day	CNS	100	NCEA (1)	NA
7440360	Antimony	Chronic	4.00E-04	mg/kg/day	0.15	6.00E-05	mg/kg/day	Blood	1000	IRIS	02/01/1991

TABLE 19
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal[3]	Absorbed RfD for Dermal		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfD:Target Organ(s)	
			Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
7440382	Arsenic	Chronic	3.00E-04	mg/kg/day	0.95	2.85E-04	mg/kg/day	Skin	3	IRIS	02/01/1993
7440393	Barium	Subchronic	7.00E-02	mg/kg/day	0.07	4.90E-03	mg/kg/day	Kidney	3	IRIS	01/21/1999
7440484	Cobalt	Chronic	2.00E-02	mg/kg/day	1	2.00E-02	mg/kg/day	NA	NA	NCEA	NA
7440508	Copper	Chronic	4.00E-02	mg/kg/day	1	4.00E-02	mg/kg/day	NA	NA	HEAST	NA
7439896	Iron	Chronic	3.00E-01	mg/kg/day	1	3.00E-01	mg/kg/day	Liver	NA	NCEA	NA
7439921	Lead	--	NA	--	--	--	--	--	--	--	--
7439965	Manganese	Chronic	2.00E-02	mg/kg/day	0.04	8.00E-04	mg/kg/day	CNS	1	IRIS	05/01/1996
22967926	Mercury (methyl mercury)	Chronic	1.00E-04	mg/kg/day	1	1.00E-04	mg/kg/day	CNS	10	IRIS	07/27/2001
7440020	Nickel	Chronic	2.00E-02	mg/kg/day	0.04	8.00E-04	mg/kg/day	Body Weight	300	IRIS	12/01/1996
7440280	Thallium	Chronic	7.00E-05	mg/kg/day	1	7.00E-05	mg/kg/day	NA	NA	Other	NA
7440622	Vanadium	Chronic	1.00E-03	mg/kg/day	0.026	2.60E-05	mg/kg/day	NA	NA	NCEA	NA

(1) Verified through Risk Assessment Information System (RAIS) data base(http://risk.lsd.ornl.gov/cgi-bin/tox/metadata) 10/1/2004
(2) RfD based on a No observed Effect Level
(3) EPA Risk Assessment Guidance for Superfund (RAGS), Volume 1 Human Health Evaluation Manual (Part E Supplemental Guidance for Dermal Risk Assessment) 2004.
Described in RI report under Section 6.1.2.3.2 Exposure Dose, Dermal Exposure.

NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables (1997)
NCEA = National Center forEnvironmental Assessment

CNS Central Nervous System
CVS Cardiovascular System
GIS Gastrointestional System
ReS Respiratory System

Table 20
NON-CANCER TOXICITY DATA -- INHALATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Chronic/ Subchronic	Inhalation RfC		USEPA Region 3 RBC Table RfDi		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfC:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds										
67641	Acetone		NA	--	--	--	--	--	--	--
71432	Benzene	Chronic	3.00E-02	mg/m3	8.60E-03	mg/kg/day	ReS	300	IRIS	4/17/2003
108907	Chlorobenzene	Chronic	2.00E-02	mg/m3	1.70E-02	mg/kg/day	Liver	NA	NCEA (1)	NA
75003	Chloroethane (Ethyl Chloride)	Chronic	1.00E+01	mg/m3	2.86E+00	mg/kg/day	Reproductive	300	IRIS	4/1/1991
67663	Chloroform	Chronic	Not Applicable	Not Applicable	1.40E-02	mg/kg/day	Eyes/Liver	NA	NCEA	NA
75343	1,1-Dichloroethane	Chronic	5.00E-01	mg/m3	1.40E-01	mg/kg/day	Kidney	NA	HEAST ALT. (1)	NA
107062	1,2-Dichloroethane	Chronic	Not Applicable	Not Applicable	1.40 E-03	mg/kg/day	Lung/Stomach	NA	NCEA	NA
75354	1,1-Dichloroethene	Chronic	2.00E-01	mg/m3	6.00E-02	mg/kg/day	Liver	30	IRIS	08/13/2002
540590	1,2-Dichloroethene (total)	--	NA	--	--	--	--	--	--	--
78875	1,2 Dichloropropane	Chronic	4.00E-03	mg/m3	1.14E-03	mg/kg/day	ReS	300	IRIS	12/1/1991
100414	Ethylbenzene	Subchronic	1.00E+00	mg/m3	2.86 E-01	mg/kg/day	NA	300	IRIS	03/01/1991
75092	Methylene Chloride (Dichlorometha	Chronic	Not Applicable	Not Applicable	8.60E-01	mg/kg/day	Liver	NA	NCEA (1)	NA
127184	Tetrachloroethene	Chronic	Not Applicable	Not Applicable	1.40E-01	mg/kg/day	Kidney	NA	NCEA (1)	NA
108883	Toluene	Chronic	4.00E-01	mg/m3	1.14 E-01	mg/kg/day	CNS/Respirator	300	IRIS	08/01/1992
71556	1,1,1-Trichloroethane	Chronic	1.00E+00	mg/m3	6.30E-01	mg/kg/day	NA	NA	Note 2	NA
79005	1,1,2-Trichloroethane	--	NA	--	--	--	--	--	--	--
79016	Trichloroethene	Chronic	4.00E-02	mg/m3	1.00E-02	mg/kg/day	CNS/Liver/End	NA	NCEA	8/1/2001
75014	Vinyl chloride (early life)	Chronic	1.00E-01	mg/m3	2.80E-02	mg/kg/day	Liver	30	IRIS	08/07/2000
	Vinyl chloride (adult)	--	NA	--	--	--	--	--	--	--
1330207	Xylenes	Subchronic	1.00E-01	mg/m3	3.00E-02	mg/kg/day	CNS	300	IRIS	2/21/2003
Semi-Volatile Compounds										
117817	bis(2-ethylhexyl)phthalate	--	NA	--	--	--	--	--	--	--
95501	1,2-Dichlorobenzene	Chronic	Not Applicable	Not Applicable	4.00E-02	mg/kg/day	Whole Body	NA	HEAST (1)	NA
541731	1,3-Dichlorobenzene	--	NA	--	--	--	--	--	--	--
106467	1,4-Dichlorobenzene	Chronic	8.00E-01	mg/m3	2.29E-01	mg/kg/day	Liver	100	IRIS	11/01/1996
91941	3,3 Dichlorobenzidine	--	NA	--	--	--	--	--	--	--
120832	2,4-Dichlorophenol	--	NA	--	--	--	--	--	--	--
105679	2,4-Dimethylphenol	--	NA	--	--	--	--	--	--	--
118741	Hexachlorobenzene	--	NA	--	--	--	--	--	--	--
77474	Hexachlorocyclopentadiene	Chronic	2.00E-04	mg/m3	5.70E-05	mg/kg/day	ReS	100	IRIS	7/5/2001
95487	2-Methylphenol	--	NA	--	--	--	--	--	--	--
106445	4-Methylphenol	--	NA	--	--	--	--	--	--	--
88744	2-Nitroaniline	Chronic	Not Applicable	Not Applicable	3.00E-05	mg/kg/day	NA	NA	Note 2	NA
87865	Pentachlorophenol	--	NA	--	--	--	--	--	--	--
120821	1,2,4-Trichlorobenzene	Chronic	Not Applicable	Not Applicable	1.00E-03	mg/kg/day	Liver/Kidney	NA	Note 2	NA
88062	2,4,6 Trichlorophenol	--	NA	--	--	--	--	--	--	--
Polyaromatic Hydrocarbons										
83329	Acenaphthene	--	NA	--	--	--	--	--	--	--
120127	Anthracene	--	NA	--	--	--	--	--	--	--
56553	Benzo(a)anthracene	--	NA	--	--	--	--	--	--	--

Table 20
NON-CANCER TOXICITY DATA -- INHALATION
BRESLUBE-PENN SUPERFUND SITE
CORAOPOLIS, PENNSYLVANIA

Chemicals of Interest		Chronic/ Subchronic	Inhalation RfC		USEPA Region 3 RBC Table RfDi		Primary Target Organ(s)	Combined Uncertainty/ Modifying Factors	RfC:Target Organ(s)	
			Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
205992	Benzo(b)flouranthene	--	NA	--	--	--	--	--	--	--
207089	Benzo(k)anthracene	--	NA	--	--	--	--	--	--	--
50328	Benzo(a)pyrene	--	NA	--	--	--	--	--	--	--
218019	Chrysene	--	NA	--	--	--	--	--	--	--
53703	Dibenzo(a,h)anthracene	--	NA	--	--	--	--	--	--	--
132649	Dibenzofuran	--	NA	--	--	--	--	--	--	--
206440	Fluoranthene	--	NA	--	--	--	--	--	--	--
86737	Fluorene	--	NA	--	--	--	--	--	--	--
193395	Indeno(1,2,3-cd)pyrene	--	NA	--	--	--	--	--	--	--
91576	2-Methylnaphthalene	--	NA	--	--	--	--	--	--	--
91203	Naphthalene	Chronic	3.00E-03	mg/m3	9.00E-04	mg/kg/day	ReS	3000	IRIS	09/17/1998
129000	Pyrene	--	NA	--	--	--	--	--	--	--
Polychlorinated Biphenyls										
53469219	PCB-1242 (Arochlor-1242)	--	NA	--	--	--	--	--	--	--
12672296	PCB-1248 (Arochlor-1248)	--	NA	--	--	--	--	--	--	--
11097691	PCB-1254 (Arochlor-1254)	--	NA	--	--	--	--	--	--	--
11096825	PCB-1260 (Arochlor-1260)	--	NA	--	--	--	--	--	--	--
Dioxans/Furans										
1746016	2,3,7,8 Tetrachlorodibenzodioxin (T	--	NA	--	--	--	--	--	--	--
Metals										
7429905	Aluminum	Chronic	Not Applicable	Not Applicable	1.00E-03	mg/kg/day	CNS	NA	NCEA (1)	NA
7440360	Antimony	--	NA	--	--	--	--	--	--	--
7440382	Arsenic	--	NA	--	--	--	--	--	--	--
7440393	Barium	Chronic	Not Applicable	Not Applicable	1.40E-04	mg/kg/day	Fetus	NA	HEAST ALT. (1)	NA
7440484	Cobalt	Chronic	NA	NA	5.70E-06	mg/kg/day	NA	NA	Note 2	NA
7440508	Copper	--	NA	--	--	--	--	--	--	--
7439896	Iron	--	NA	--	--	--	--	--	--	--
7439921	Lead	--	NA	--	--	--	--	--	--	--
7439965	Manganese	Chronic	5.00E-05	mg/m3	1.43E-05	mg/kg/day	CNS	1000	IRIS	12/01/1993
7439976	Mercury (methyl mercury)	Chronic	3.00E-04	mg/m3	8.60E-05	mg/kg/day	vous System/H	30	IRIS	6/1/1995
7440020	Nickel	--	NA	--	--	--	--	--	--	--
7440280	Thallium	--	NA	--	--	--	--	--	--	--
7440622	Vanadium	--	NA	--	--	--	--	--	--	--

(1) Verified through Risk Assessment Information System (RAIS) data base(http://risk.lsd.ornl.gov/cgi-bin/tox/metadata) 10/1/2004
(2) EPA Provisional Review

NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables (1997)
NCEA = National Center forEnvironmental Assessment

CNS Central Nervous System
CVS Cardiovascular System
GIS Gastrointestional System
ReS Respiratory System

TABLE 21
SUMMARY OF POTENTIAL HUMAN HEALTH RISKS
BRESLUBE-PENN SUPERFUND SITE FEASIBILITY STUDY
(Corrected for background contributions)

RECEPTOR	TIMEFRAME	MEDIUM	EXPOSURE ROUTE	RECEPTOR AGE	CANCER RISK	HAZARD QUOTIENT
Facility Trespasser	Current	Surface Soil	Ingestion	Adult	3.70E-06	NA
				Child	8.70E-06	NA
			Dermal	Adult	3.80E-06	NA
				Child	6.10E-06	NA
		Shallow Groundwater	Inhalation	Adult	1.70E-07	0.001
				Child	4.70E-07	0.005
		Wetland Sediment	Ingestion	Adult	2.20E-06	0.02
				Child	5.00E-06	0.007
			Dermal	Adult	1.70E-06	0.002
				Child	6.80E-05	0.14
		Wetland Surface Water	Ingestion	Adult	2.50E-07	0.02
				Child	2.80E-07	0.05
			Dermal	Adult	3.20E-05	0.31
				Child	2.80E-05	0.54
Facility Commercial Worker	Future	Surface Soil	Ingestion	Adult	2.30E-05	NA
			Dermal	Adult	3.90E-05	NA
		Shallow Groundwater	Inhalation/Outdoors	Adult	6.70E-06	0.03
			Inhalation/Indoor	Adult	7.60E-07	0.003
Facility Construction Worker	Future	Soil	Ingestion	Adult	5.90E-06	**2.1**
			Dermal	Adult	2.20E-06	0.98
		Groundwater	Inhalation-Outdoor Air	Adult	2.90E-07	0.03
Resident (Facility)	**Future**	**Shallow Groundwater**	**All pathways**	**Adult**	**Approx. 1**	**350,000**
				Child	**Approx. 1**	**730,000**
		Bedrock Groundwater	**All pathways**	**Adult**	**1.70E-03**	**9**
				Child	**9.40E-04**	**17**
		Surface Soil	**All pathways**	**Adult**	**7.50E-05**	**0.7**
				Child	**1.50E-04**	**6**
		Subsurface Soil	**All pathways**	**Adult**	**1.00E-04**	**1.8**
				Child	**2.50E-04**	**15**
Off-Facility Recreational User	Current	Surface Soil	Ingestion	Adult	7.90E-07	0.03
				Child	1.80E-06	0.13
			Dermal	Adult	8.70E-07	0.03
				Child	1.40E-06	0.1
		Shallow Groundwater	Inhalation	Adult	NA	0.00002
				Child	NA	0.0001
		Montour Run Surface Water	**All pathways**	**Adult**	**3.00E-07**	**0.003**
				Child	**2.00E-07**	**0.004**
		Montour Run Sediment	**All pathways**	**Adult**	**6.00E-07**	**0.03**
				Child	**6.00E-06**	**0.4**
Off-Facility Commercial	Future	Surface Soil	Ingestion	Adult	4.90E-06	0.14
			Dermal	Adult	9.00E-06	0.26

TABLE 21
SUMMARY OF POTENTIAL HUMAN HEALTH RISKS
BRESLUBE-PENN SUPERFUND SITE FEASIBILITY STUDY
(Corrected for background contributions)

RECEPTOR	TIMEFRAME	MEDIUM	EXPOSURE ROUTE	RECEPTOR AGE	CANCER RISK	HAZARD QUOTIENT
Worker		Shallow Groundwater	Inhalation/Outdoors	Adult	NA	0.0007
			Inhalation/Indoor	Adult	NA	0.001
Off-Facility Construction Worker	Future	Soil	Ingestion	Adult	9.30E-07	**1.4**
			Dermal	Adult	3.80E-07	0.6
		Groundwater	Inhalation-Outdoor Air	Adult	NA	0.001
Resident (Off-Facility)	**Future**	**Shallow Groundwater**	**All pathways**	**Adult**	**5.50E-03**	**210**
				Child	**2.30E-03**	**430**
		Bedrock Groundwater	Ingestion	Adult	**4.70E-03**	**31**
				Child	**2.80E-03**	**72.2**
			Dermal	Adult	5.00E-05	0.39
				Child	2.80E-05	0.6
			Inhalation While Showering	Adult	**3.40E-04**	**5.1**
		Surface Soil	**All pathways**	**Adult**	**3.00E-05**	**2**
				Child	**7.00E-05**	**19**
		Subsurface Soil	**All pathways**	**Adult**	**2.00E-04**	**15**
				Child	**4.50E-04**	**130**

NA – Not Applicable, No Chronic Risk
Receptors and exposure pathways evaluated by EPA; risks not corrected for background contributions
Bolded values exceed a cancer risk of 1E-04 and/or an HI of 1

TABLE 22
SITE COCs AND REMEDIAL ACTION LEVELS
BRESLUBE PENN SUPERFUND SITE

COCs	Maximum Concentration Detected	REMEDIAL ACTION LEVELS State & Federal Chemical-Specific ARARs			
		PADEP ACT 2 (Direct Contact)	PADEP ACT 2 (Soil to Groundwater)	EPA SITE RISK LEVEL SITE SPECIFIC (TBC)	PADEP Non Residential Vap. Intrusion (TBC) (7)
Facility Surface Soils (mg/kg)		mg/kg (1)	mg/kg (3)	mg/kg	mg/kg
Benzo(a)pyrene (5)	27	**11**	46	NC	—
Lead (6)	1,290	**500**	**450**	**1000**	—
Chromium (5)	469	**420**	**190**	NC	—
Manganese (5)	24,300	190,000	—	NC	—
Aroclor 1260	94	130	500	**15***	—
Facility Soils (Construction Worker) combined (mg/kg)		mg/kg (1,2)	mg/kg (3)	mg/kg	mg/kg
Tetrachloroethene (6)	27	1500/3300	**0.43**	NC	**10**
2,3,7,8-Tetrachlorodibenzodioxin (TEQ) (5)	0.00015	0.00053/190000	0.032	NC	—
Benzo(a)pyrene (5)	12	190,000	46	NC	—
Naphthalene (5)	2,300	56000/190000	**25**	NC	—
Aroclor 1242	5.2	160/10,000	16	**15***	—
Aroclor 1248	39	44/10,000	**18**	**15***	—
Aroclor 1254	250	**44**/10,000	**75**	**15***	—
Aroclor 1260	92	130/190000	500	**15***	—
Off-facility Surface Soils (mg/kg)		mg/kg (3)	mg/kg (3)	mg/kg	mg/kg
Aroclor 1242	0.93	36	16	1.5*	—
Aroclor 1254	6.7	**4.4**	75	**1.5***	—
Aroclor 1260	6.4	30	500	**1.5***	—
Chromium (5)	191	**94**	**190**	NC	—
Lead (6)	470	500	**450**	1000	—
Manganese (6)	13,100	31000	—	NC	—
Off-facility Soils (Construction Worker) combined (mg/kg)		mg/kg (1,2)	mg/kg (3)	mg/kg	mg/kg
Aroclor 1242	—	160/10,000	16	15*	—
Aroclor 1254	140	**44**/10,000	**75**	**15***	—
Aroclor 1260	3.7	130/190000	500	15*	—
Manganese (5)	2,980	190,000/190,000	—	NC	—
Facility Wetland Sediment (mg/kg)		mg/kg (3)		mg/kg	
Lead	435	500	—	500	—

EPC = Exposure Point Concentration
— No Standard
NOC Not of Concern
NA Not Available
* Calculated Site-specific Human Health Risk Level for non residential risk for On-Facility and residential risk for Off-Facility
NC Not Calculated. The cumulative residual risk will be calculated when the cleanup is believed to be achieved to verify that risk is acceptable (1E-6 to 1E-4 or less, and HI of 1 or less per target organ).

RIR = Remedial Investigation Report
PADEP = Pennsylvania Department of Environmental Protection
USEPA = United States Environmental Protection Agency
ARARs = Applicable or Relevant and Appropriate Requirements
Bold = COC exceeds ARAR

(1) PADEP Act 2 Direct Contact Medium-Specific Concentration (MSC) for Non-residential Surface Soils (Table 3A - organics; Table 4A -inorganics)
(2) PADEP Act 2 Direct Contact MSC for Non-residential Subsurface Soils (Table 3A - organics; Table 4A -inorganics)
(3) PADEP Act 2 Direct Contact MSC for Residential Soils (0-15') (Table 3A - organics; Table 4A - inorganic)
(4) PADEP Act 2 Soil to Groundwater MSC for Used Aquifer, Total Dissolved Solids <=2500, Residential, Generic Value (Table 3B - organics; Table 4B - inorganics)
(5) Exceeds acceptable residential human health risk level, but lower than acceptable non-residential human health risk level
(6) COC because of PADEP ARAR excedances
(7) PADEP Technical Guidance Manual-Section IV.A.4 Vapor Intrusion in Building from groundwater and soil under Act 2, Table 5 Nonresidential

TABLE 22 (cont.)
SITE COCs AND REMEDIAL ACTION LEVELS
BRESLUBE PENN SUPERFUND SITE

COCs * for Groundwater	Maximum Concentration Detected in groundwater µg/L	REMEDIAL ACTION LEVELS State & Federal Chemical-Specific ARARs			
		PADEP ACT 2 (Direct Contact) µg/L (1)	USEPA MCLs µg/L (2)	Surface Water µg/L	PADEP Residential Vap Intrusion µg/L (TBC)(4)
Acetone	4,300	**3,700**	---	3,500	NOC
Benzene	2,600	**5**	**5**	1.2	3,500
Chloroethane	23,000	**230**	---	N/A	**22,000**
Chloroform	15	*100*	*80*	5.7	410
1,2-Dichlorobenzene	1,100	**600**	**600**	2700	NOC
1,3-Dichlorobenzene	2,000	**600**	---	2700	---
1,4-Dichlorobenzene	11,000	**75**	**75**	2700	8,100
1,1-Dichloroethane	7,200	**27**	---	N/A	160,000
1,2-Dichloroethane	100	**5**	**5**	0.38	2,800
1,1-Dichloroethene	1300	**7**	**7**	0.057	160,000
1,2-Dichloroethene (total); (cis/trans)	13,000	**70/100**	**70/100**	700 (trans)	42,000/59,000
2,4-Dichlorophenol	880	**20**	---	93	---
2,4-Dimethylphenol	230	730	---	540	---
Ethylbenzene	330	700	700	3100	27,000
Methylene Chloride	720	**5**	**5**	4.7	77,000
Tetrachloroethylene	3.5	5	5	0.8	42,000
Toluene	4,600	**1,000**	**1,000**	6800	490,000
1,2,4-trichlorobenzene	1,800	**70**	**70**	330	NOC
1,1,1-Trichloroethane	11,000	**200**	**200**		NOC
1,1,2-Trichloroethane	160	**5**	3 (3)		5400
Trichloroethylene	250	**5**	**5**	2.7	14000
Vinyl chloride	4,900	**2**	**2**	2	**1800**
Xylenes (total)	1,200	10,000	10,000	70000	130000
2-Methylnaphthalene	40,000	730	---	---	NOC
2-Methylphenol	770	---	---	---	---
4-Methylphenol	48	---	---	---	---
Acenaphthene	1,300	2,200	---	1200	NOC
Benz(a)anthracene	22	**0.9**	---	0.0044	---
Benzo(b)fluoranthene	4.2	**0.9**	---	---	---
Chrysene	35	**1.9**	---	0.0044	---
DEHP	2,900	**6**	**6**	1.8	---
Dibenzofuran	1,400	---	---	---	---
Fluoranthene	2,400	**260**	---	300	---
Fluorene	3,200	**1,500**	---	1300	NOC
Naphthalene	5,600	**100**	---	N/A	25,000
Pentachlorophenol	1.9	**1**	**1**	0.28	---
Phenanthrene	7,500	**1,100**	---	N/A	NOC
Pyrene	1,500	**130**	---	960	---
Aroclor-1254	280000	**0.37**	**0.5**	4.4E-05	---
Aroclor-1260	3.8	**1.1**	**0.5**	4.4E-05	---
Aluminum	110,000	---	---	N/A	---
Antimony	76	**6**	**6**	14	---
Arsenic	529	**50**	**10**	50	---
Barium	2,580	**2,000**	**2,000**	2,400	---
Chromium (total)	132	**100**	**100**	N/A	---
Iron	136,000	---	---	---	---
Lead	127	**5**	**15**	N/A	---
Manganese	26,300	---	---	---	---
Thallium	4.7	**2**	**0.5** (3)	1.7	---
Vanadium	193	260	---	NA	---
Facility Wetland Surface Water (µg/L)				µg/L (10)	
Lead	55.3	---	---	N/A	---

EPC = Exposure Point Concentration
--- No Standard
N/A Not Available
NOC Not of Concern
* The listed COCs are found to exceed EPA residential Human Health Risk Acceptable Levels

(1) PADEP Act 2 Medium-Specific Concentrations for Groundwater; residential used aquifer, TDS <=2500 (Table 1 (organic) and Table 2 (inorganic)
(2) USEPA Maximum Contaminant Level (MCL); Drinking Water Standards and Health Advisory (EPA, 2004)
(3) Maximum Contaminant Level Goal (MCLG)
(4) PADEP Technical Guidance Manual-Section IV.A.4 Vapor Intrusion in Building from groundwater and soil under Act 2, Table 1 Residential

Note: Contaminated groundwater cleanup outside the WMA will be performed to reduce COCs in contaminated groundwater to MCLs or non-zero MCLGs whichever is more stringent and additionally, to achieve the cumulative risk from residual COCs to acceptable risk levels (1E-6 to 1E-4 or less, and HI of 1 or less per target organ). However EPA will not require COCs to be reduced below background concentrations.

Appendix III

Administrative Record Index

BRESLUBE-PENN SITE
ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

II. REMEDIAL ENFORCEMENT PLANNING

1. First Amendment to Administrative Order on Consent for Remedial Investigation/Feasibility Study, in the Matter of: The Breslube-Penn Superfund Site, Docket No. III-2000-006-DC, 3/30/05. P. 200001-200004 A transmittal letter is attached.

* Administrative Record File available 1/26/07, updated 3/28/07, 8/31/07.

III. REMEDIAL RESPONSE PLANNING

1. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, prepared by U.S. EPA, 12/88. P. 300001-300172.

2. Report: Human Health Evaluation Manual - Risk Assessment Guidance for Superfund Volume 1, prepared by U.S. EPA, 12/89. P. 300173-300216.

3. Memorandum to Regional Directors, U.S. EPA, from Mr. Elliott P. Laws, re: Land use in remedy selection process, 5/25/95. P. 300217-300227.

4. Report: Evaluation of Subsurface Engineered Barriers at Waste Sites, prepared by U.S. EPA, 8/98. P. 300228-300261. The "Development and Screening of Alternatives- Chapter 4" is attached.

5. Excerpt from Report: 40 CFR Ch. 1 (7-1-99 Edition). P. 300262-300267.

6. Letter to Mr. Paul Tomiczek, Civil & Environmental Consultants, Inc., from Mr. Bhupi Khona, U.S. EPA, re: EPA Comments on Revised Phase II Scope, 5/24/01. P. 300268-300278. The following are attached:

   A) an April 23, 2001, memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Herminio Concepcion, U.S. EPA, regarding comments on Phase 1/Phase 2 Work Plan;

   B) an April 9, 2001, memorandum to Mr. Bhupi Khona, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, regarding comments on Phase 1/Phase 2 Work Plan;

   C) an April 25, 2001, letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Dawna Yannacci, Pennsylvania Department of Environmental Protection (PADEP), regarding comments on Proposed Phase 2 Investigation Scope;

   D) an April 26, 2000, memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, regarding comments on proposed Phase 2 Investigation Scope.

7. Letter to Mr. Bhupi Khona, U.S. EPA, from Mr. Paul Tomiczek, Civil & Environmental Consultants, Inc. (CEC), re: Responses to Agency comments on Proposed Phase 2 Investigation Scope, 5/31/01. P. 300279-300295.

8. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, re: Comments on Tier 1 Screening Level Ecological Risk Assessment, 4/15/02. P. 300296-300297.

9. Letter to Mr. Paul Tomiczek, CEC, from Mr. Bhupi Khona, U.S. EPA, re: EPA comments on Phase 2 Technical Memorandum and proposed Phase 3 investigation, 4/19/02. P. 300298-300304. A November 27, 2001, memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Herminio Concepcion, U.S. EPA, regarding comments on Phase 2 Technical Memorandum and proposed Phase 3, A March 4, 2002 electronic memorandum to Mr. Bhupi Khona, U.S. EPA, from Ms. Nancy Rios-Jafolla regarding comments on Phase 2 Technical Memorandum and proposed Phase 3, and a March 15, 2002 memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, regarding comments on Phase 2 Technical Memorandum and proposed Phase 3 are attached.

10. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, re: Responses to Agency Comments on Phase 2 Technical Memorandum and Proposed Phase 3 Investigation Scope, 5/3/02. P. 300305-300317.

11. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, re: Comments on Phase 2 Technical Memorandum and proposed Phase 3 Investigation Scope, 5/8/02. P. 300318-300319.

12. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, re: Response to Comments on Phase 2 Technical Memorandum and Proposed Phase 3 Investigation Scope, 6/5/02. P. 300320-300320

13. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: Response to comments on Phase 2 Technical Memorandum, 6/5/02. P. 300321-300321.

14. Packet of supporting documents for Feasibility Study Alternatives Discussion, 5/03. P. 300322-300354. Handwritten List of Documents is attached.

15. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, re: Comments on Remedial Investigation Report, 5/20/03. P. 300355-300356.

16. Electronic memorandum to Ms. Jennifer Hubbard, U.S. EPA, from Mr. Bhupi Khona, U.S. EPA, re: Air models in remedial investigation, 9/25/03. P. 300357-300364. A September 23, 2003 memorandum to Ms. Jennifer Hubbard, U.S. EPA, from Ms. Patricia Flores-Brown, U.S. EPA, is attached.

17. Letter to Mr. Paul Tomiczek, CEC, from Mr. Bhupi Khona, U.S. EPA, re: Packet of comments on draft remedial investigation report, 10/9/03. P. 300365-300409.

18. Report: Draft Remedial Investigation Report, Response to Agency Comments, prepared by CEC, 1/30/04. P. 300410-300482. A March 24, 2004, letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Dawna Saunders, PADEP, regarding comments on revised Remedial Investigation report, a February 13, 2004, memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Bruce Pluta, U.S. EPA, regarding comments on revised Remedial Investigation report, and a March 23, 2004, letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Mary Jo Apakin, CDM Federal Programs Corporation (CDM), regarding comments on revised Remedial Investigation report, are attached.

19. Electronic memorandum to Mr. Joseph Donovan, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: Deed restrictions and future land use, 12/13/04. P. 300483-300491.

20. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Ms. Jennifer Hubbard, U.S. EPA, re: Summary of issues related to remedial investigation and comment resolution, 12/15/04. P. 300492-300496.

21. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, re: Explanation for Differences in Risk Evaluation, 1/21/05. P. 300497-300502.

22. Letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, re: Draft Remedial Investigation Report, 2/14/05. P. 300503-300508. An attachment table to the Remedial Investigation Report, Comprehensive Summary of Baseline Risks, is attached.

23. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza and Mr. Kenneth Miller, CEC, re: Notification of Objections, 3/2/05. P. 300509-300575.

24. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, re: Revised Remedial Investigation Report, 3/2/05. P. 300576-300576.

25. Electronic memorandum to Ms. Karen Souza, CEC, from Bhupi Khona, U.S. EPA, re: Dispute resolution letter, 3/3/05. P. 300577-300577.

26. Electronic memorandum to Ms. Karen Souza, CEC, from Bhupi Khona, U.S. EPA, re: Risk assessment information in the "Notice of Objection" letter, 3/18/05. P. 300578-300578.

27. Facsimile transmittal memorandum to Ms. Karen Souza, CEC, from Bhupi Khona, U.S. EPA, re: Risk calculations of materials, 3/29/05. P. 300579-300594.

28. Electronic memorandum to Mr. Tom Gricks, Eckert Seamans Cherin & Mellott, LLC, from Ms. Mary Rugala, U.S. EPA, re: Notification of Objections, 4/27/05. P. 300595-300595.

29. Report: Remedial Investigation Report, Volume II of III, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 8/31/05. P. 300596-302259.

30. Report: Remedial Investigation Report, Volume III of III, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 8/31/05. P. 302260-305793. A February 14, 2005, letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, regarding the comments on the draft Remedial Investigation Report, is attached.

31. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, and Mr. Kenneth Miller, CEC, re: Packet of revised pages of Remedial Investigation Report-Revision 3, 8/31/05. P. 305794-305806.

32. Report: Remedial Investigation Report, Volume I of III, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 8/31/05. P. 305807-306560.

33. Letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, re: Attached EPA comments on Draft Feasibility Study, 11/9/05. P. 306561-306617. A November 23, 2005 letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, and Mr. Kenneth Miller, CEC, regarding CEC response to U.S. EPA comments on Draft Feasibility Study Report, and a December 1, 2005, letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, regarding meeting to discuss EPA comments, are attached.

34. FedEx U.S. Airbill to Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, 11/9/05. P. 306618-306618.

35. U.S. EPA comments on Revised Draft Feasibility Study Report, prepared by U.S. EPA, 1/6/06. P. 306619-6641. A June 22, 2006, transmittal letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, is attached.

36. Report: Feasibility Study Report, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 1/6/06. P. 306642-306862.

37. Technical memorandum to Mr. Bhupi Khona and Ms. Mary Rugala, U.S. EPA, from Ms. Karen Souza and Mr. Ken Miller, CEC, re: A Case for Enhanced In-situ Bioremediation of Chlorinated Aliphatic Hydrocarbons in Groundwater, 1/31/06. P. 306863-306877.

38. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, re: Request for deadline extension for submittal of revised Feasibility Study Report, 6/29/06. P. 306878-306881.

39. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza and Kenneth Miller, CEC, re: Revised Feasibility Study Report, 8/2/06. P. 306882-306883.

40. Report: Redlined Version of Feasibility Study Report, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 8/2/06. P. 303884-307080.

41. Memorandum to Mr. Bhupi Khona and Mr. Jeffrey Garcia, U.S. EPA, from Breslube-Penn Steering Committee re: Resolution of Final EPA Comments on Feasibility Study Report, 9/20/06. P. 307081-307086.

42. Electronic memorandum to Ms. Karen Souza, CEC, from Ms. Dawna Saunders, PADEP, re: Comments on revised Feasibility Study Report, 10/12/06. P. 307087-307088.

43. Letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, re: Draft Feasibility Study approval, 11/22/06. P. 307089-307104. A November 10, 2006, letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Karen Souza, CEC, regarding response to EPA comments on Feasibility Study Report, an October 26, 2006, letter to Ms. Karen Souza, CEC, from Mr. Bhupi Khona, U.S. EPA, regarding resolution of final EPA comments on Feasibility Study Report, and an October 12, 2006, electronic memorandum to Ms. Karen Souza, CEC, from Ms. Dawna Saunders, regarding comments on revised Feasibility Study Report, are attached.

44. Report: Feasibility Study Report, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 12/6/06. P. 307105-307346. A transmittal letter is attached.

45. Report: Feasibility Study Report, Red-Lined Version, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 12/6/06. P. 307347-307498.

46. Report: Feasibility Study Report Addendum, Breslube-Penn Superfund Site, Allegheny County, Pennsylvania, prepared by CEC, 2/20/07. P. 307499-307526.

47. Letter to Mr. Bhupi Khona, U.S. EPA, from Ms. Mary Jo Apakian, CDM Federal Programs Corp., re: Comments on the January 31, 2006 In Situ Bioremediation Technical Memorandum, 2/28/06. P. 307527-307529.

48. Proposed Plan, Breslube-Penn Superfund Site, 3/07. P. 307530-307587.

49. "Land Recycling Program Technical Guidance Manual-Section IV.A.4. Vapor Intrusion into Buildings from Groundwater and Soil under the Act 2 Statewide Health Standard," prepared by Pennsylvania Department of Environmental Protection, 1/24/04. P. 307588-307644.

50. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Larry Johnson, U.S. EPA, re: Citizen comment on Proposed Plan, 4/23/07. P. 307645-307645.

51. Letter to Mr. Bhupi Khona, U.S. EPA, from Mr. Daniel Trocchio, Kirkpatrick & Lockhart Preston Gates Ellis LLP, re: Comments on Proposed Remedial Action Plan, 4/30/07. P. 307646-307647.

52. Letter to Mr. Larry Johnson, U.S. EPA, and Mr. Bhupi Khona, U.S. EPA, from Mr. Thomas Gricks, Schnader Harrison Segal and Lewis LLP, re: Comments on Proposed Remedial Action Plan, 4/30/07. P. 307648-307648.

53. Memorandum to Mr. Bhupi Khona, U.S. EPA, from Mr. Leo Brausch, Breslube Site Working Group, re: Site Groundwater Issues, 7/5/07. P. 307649-307649.

54. Memorandum to File, from Mr. Jefferie Garcia, U.S. EPA, and Mr. Bhupi Khona, U.S. EPA, re: Explanation of redactions to the Administrative Record for the Breslube Penn Superfund Site, 8/21/07. P. 307650-307650.

55. Record of Decision, Breslube-Penn Superfund Site, 8/07. P. 307651-307782.

V. COMMUNITY INVOLVEMENT/CONGRESSIONAL CORRESPONDENCE/IMAGERY

1. Transcript of Public Meeting Minutes, Breslube Penn, Inc. Superfund Site, 4/18/07. P. 500001-500061. A May 11, 2007 cover letter to Mr. Larry Johnson, U.S. EPA, from Ms. Danielle Bailey, Chenega Integrated Systems, LLC, is attached.

Appendix IV

State Concurrence Letter

Pennsylvania Department of Environmental Protection

400 Waterfront Drive
Pittsburgh, PA 15222-4745
July 30, 2007

Southwest Regional Office

412-442-4000
Fax 412-442-4194

James J. Burke
Division Director
Hazardous Site Cleanup Division
EPA Region III
3HS00
1650 Arch Street
Philadelphia, PA 19103-2029

RE Breslube-Penn Site
LRP # 5-2-927-1913
Allegheny County
Record of Decision

Dear Mr. Burke:

The Department of Environmental Protection (Department) has reviewed the Record of Decision (ROD) received via email June 11, 2007 and amended July 19, 20, 24, 25 and 26, 2007 for the Breslube-Penn Site located in Moon Township, Allegheny County.

The Selected Remedy in this ROD includes:

- Excavation of contaminated soils exceeding the Remedial Action Objectives (RAOs) located off the facility property and consolidation of these soils into the Waste Management Area (WMA).
- Removal of two feet of surface soil located on the facility property and outside the WMA that pose a human health contact risk and/or contain Contaminants of Concerns above soil to groundwater Act 2 levels and/or any oil stained soil.
- Installation of a RCRA modified cap over the 4.7-acre WMA with an impermeable membrane to restrict direct contact and infiltration of precipitation into the soils.
- Installation of a 2 to 3-feet thick vertical slurry wall around the perimeter of the 4.7-acre WMA to restrict groundwater flow into and out of the source area at the WMA.
- Installation and operation of a product recovery system to remove floating and collectible light non-aqueous phase liquids such as oil from the soil and the surface of the groundwater table.
- Installation of a fence to restrict access to the Facility.
- Enhancement of in-situ bioattenuation through the injection of reagents to reduce concentrations of VOCs in groundwater outside the WMA to RAO.
- Performance of long-term groundwater, surface water and slurry wall monitoring.
- Implementation of institutional controls (such as title notices and land use restrictions through easements and covenants and orders from or agreements with EPA and/or PADEP) to restrict use of the Site and to prevent potable use of contaminated groundwater.

- The wetlands located on the WMA will be removed as part of the Selected Remedy and replaced in accordance with Section 404 of the Clean Water Act.

The Department hereby concurs with the EPA's proposed remedial action for the Breslube-Penn Site with the following conditions:

- The EPA will assure that the Department is provided an opportunity to fully participate in any negotiations with the responsible parties.
- The Department concurrence is not to be construed as receiving or qualifying for release from liabilities offered under The Land Recycling and Environmental Remediation Standards Act (Act 2).
- Public comment and the issuance of an Explanation of Significant Differences be required prior to any modification of the ROD.
- The Department reserves its rights and responsibility to take independent enforcement action pursuant to state law.
- This concurrence with the selected remedial action is not intended to provide any assurances pursuant to SARA Section 104(c)(3).

If you have any questions regarding this matter, please do not hesitate to contact me or the Project Manager, Dawna Saunders, at 412-442-4000.

Sincerely,

Kenneth T. Bowman

Kenneth T. Bowman, P.E.
Regional Director
Southwest Regional Office

Appendix V

Responsiveness Summary

RESPONSIVENESS SUMMARY
FOR THE
BRESLUBE-PENN SUPERFUND SITE
MOON TOWNSHIP, ALLEGHENY COUNTY, PENNSYLVANIA

INTRODUCTION

This Responsiveness Summary provides a summary of public comments and concerns regarding the Proposed Plan for the Breslube-Penn Superfund Site. It also provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments. After reviewing and considering all public comments received during the public comment period, EPA has selected a remedy for the contamination at the Site.

The Proposed Plan and supporting documentation were made available to the public in the administrative record file at the EPA Region III Public Reading Room, 6th Floor, at 1650 Arch Street in Philadelphia, PA and in the Information Repository at the Coraopolis Memorial Library at State and School Streets in Coraopolis, PA. EPA issued a notice in the *Pittsburgh Post-Gazette* on April 14, 2007 which contained information relevant to the duration of the public comment period, the date of the public meeting, and the availability of the Proposed Plan and the entire Administrative Record. The public comment period which relates to these documents was held from March 30 through April 30, 2007

EPA conducted a public meeting in Coraopolis, Pennsylvania to inform local officials and interested citizens about the Superfund process, to review proposed remedial activities at the Site and receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties. The public meeting was held by EPA on April 18, 2007 at Council Chambers, 1012 5th Avenue, Coraopolis, PA. Responses to the comments received at the public meeting and during the public comment period are included in this Responsiveness Summary.

In general, the community responded positively to EPA's Proposed Plan. A majority of the residents recognized the importance of remediating the contamination at the Breslube-Penn Site.

The next section of this Responsiveness Summary provides a comprehensive summary of major questions, comments, concerns, and responses, by summarizing oral and written comments received during the public comment period and EPA's responses.

The last section of this Responsiveness Summary includes appendices which document public participation in the remedy selection process for this Site. There are four appendices attached to this Responsiveness Summary. They are as follows:

Appendix A contains the Proposed Plan that was distributed to the public for review and comment;

Appendix B contains the public notice which appeared in the newspaper;

Appendix C contains the transcript of the public meeting; and

Appendix D contains the written comments received by EPA during the public comment period.

COMPREHENSIVE SUMMARY OF MAJOR QUESTIONS, COMMENTS, CONCERNS, AND RESPONSES

Oral Comments Received During Public Meeting

This section summarizes the questions and comments that arose during the public meeting on April 18, 2007, along with EPA's response.

1. The questioner asked about the amount of engineering that has been done to arrive at the recommended alternative, and how much is left to do.

- *At this phase of the project, primarily conceptual engineering has been done. The goal of the RI/FS is to determine the extent and magnitude of the contamination and evaluate the technologies available to remediate the Site. During the design phase, the detailed engineering design will be developed. This will include the determining the specifications of the cap, slurry wall, enhanced bioattenuation, and pump and treat system. An estimated 12 – 18 months of design engineering is anticipated.*

2. Will EPA excavate to form the slurry wall or is that going to be done hydraulically? Will the slurry wall be a continuous wall around the perimeter?

- *Slurry wall construction is a well established technology. As the trench is excavated, bentonite slurry is injected to provide hydrostatic pressure to prevent the trench walls from collapsing. At the same time, the bentonite slurry is mixed with soil and possibly cement for added strength. This material is then placed in the slot that was just excavated, displacing the liquid slurry. The bentonite slurry solidifies and become a permanent structure.*

3. The questioner asked if the depth of the slurry wall has been determined.

- *An approximate depth of 50 feet (at least 4 or 5 feet into the bedrock) has been estimated. This will be reexamined during the design to determine if that depth is sufficient.*

4. The questioner asked whether the PCBs would be disturbed by the construction and subsequently washed down the creek. A concern that these contaminants would end up in drinking water was expressed, as well as concern about health effects from construction dust and construction-related problems with water and sewer.

- *During construction, appropriate controls (erosion fencing, etc) will be constructed to ensure there are no releases to the creek; in addition, EPA will monitor the levels of dust generated. If dust becomes an issue during excavations, moisture or other dust suppression techniques can be used, as needed, to control dust. VOC monitors are also*

used during construction to monitor the levels of volatile organic chemicals in the air, which are generally the contaminants that cause odor problems. EPA will take every precaution to eliminate risks to human health and drinking water sources from the remedial action phase. All the results of the monitoring and sampling performed during construction will be available to the public, as well as all the information collected during other phases of the project.

5. The questioner asked about the future of the Site after the cleanup and whether an occupancy permit for another industrial facility could be granted.

- *A portion of the property, approximately 5 acres will consist of a cap and slurry wall. This portion will have ICs to prevent use of the property which could have a negative impact on the remedy. Because waste will be left in place, EPA will review the Site every 5 years to insure that the remedy remains intact and effective.*

6. What is the anticipated depth of the cap?

- *EPA estimates that the cap will be about 4 or 5 feet in depth. There are several methods for constructing caps. Some caps are constructed of a very thick nonpermeable plastic liner with a clay layer on top of that, followed by layers of soil, sand, soil, and vegetation for drainage. RCRA Modified Cap materials depend on the topography and future land use at the Site. A final design will be presented to the community prior to the start of construction.*

7. Does EPA have downstream water monitoring in Montour Run, and is groundwater from the Site flowing into Montour Run?

- *Surface water and sediment samples were collected downstream and upstream of the Site, and none of the samples indicated that Montour Run is affected by the Site. EPA also concluded that some of the contaminated groundwater may be discharging to the Montour Run and the majority of it is going under Montour Run and coming up on the other side.*

8. Where is EPA's Site information available?

- *EPA's Site documents can be found by going to www.epa.gov/arweb and selecting Pennsylvania, Breslube-Penn, and searching the Breslube-Penn Site itself. All the documents associated with the Site will be on that web page in chronological order.*

9. How far from the Site is EPA monitoring and how far does the groundwater plume extend?

- *The Work Group has collected soil, surface water, and groundwater samples off-facility. Soil samples were taken approximately as far as North Petrie Road. Groundwater contamination does not extend to the two homes located past the Coraopolis Sports Club.*

The farther away from the Site, the less the contamination. There is no contamination toward Coraopolis; the groundwater does not flow in that direction. See the figure 10 for the extent of contamination.

Written Comments Received During the Public Comment Period

This section summarizes written comments received during the public comment period along with EPA's response.

1. The writer concurred with EPA on the selection of Alternative 4. The written comment expressed specific appreciation of the inclusion of Contingencies 1 and 2 and the consolidation of all contaminated soil.

- *EPA concurs with this comment.*

2. The writer argued against the inclusion of contingencies for extraction and treatment of groundwater either within or outside of the WMA. The written comment stated that due to the minimal likelihood of there being future residential users of groundwater at or around the Site, bio-attenuation and use restrictions should be implemented to avoid the costs of extracting and treating groundwater.

- *Under CERCLA and the 1990 National Contingency Plan (NCP), EPA is directed to meet certain expectations in addressing groundwater contamination. Under NCP regulations, EPA is expected to return useable groundwater to their beneficial uses wherever practicable within a time frame that is reasonable, given the circumstances of a site 40 C.F.R. § 300.430(a)(1)(iii)(F). To meet ARARs, groundwater at and outside the WMA must be remediated to drinking water standards.*

3. The writer presented clarification that the PRPs that performed the RI/FS at the Breslube-Penn Site (the "Work Group") were not among those PRPs who undertook and failed to complete the removal actions pre-dating the RI/FS. The writer further stated that no members of the Work Group were asked to undertake any activities at the Site prior to receiving the Special Notice Letters in 1997.

- *EPA concurs with this comment and had made this distinction in the ROD.*

The following written comments were received after the comment period was closed. However EPA has decided to respond to these comments.

What were the Procedures used by USEPA in developing the final lists of constituents of concern (COCs)

The list of human health constituents of concern (COCs; also known as chemicals of concern or contaminants of concern) was originally developed by EPA in a December 15, 2004 memo; that list of chemicals was also transmitted in the EPA letter to Karen Souza dated February 14, 2005. The general principle in identifying the initial group was that chemicals are COCs if they contribute significantly to a total cancer risk above 1E-4, a target-organ-specific Hazard Index above 1, and/or projected blood-lead concentrations exceeding 10 ug/dL for more than 5% of the modeled population. Additionally, to be COCs, the chemicals also must be present at concentrations not attributable to background (determined through statistical testing). As memorialized in memos resulting from a September 15, 2006, meeting, the EPA RPM agreed that arsenic in soil did not need to be included as a COC, based on the results of local sampling. Furthermore, the EPA RMP has determined that iron should be excluded as a COC at the Site because the high levels of iron identified off-facility soils are not related to the source of contamination.

For soil, the only human health COCs for worker exposure were PCBs, and the remedy is expected to achieve soil concentrations that would be protective of worker exposure. For that reason, site-specific remediation goals for PCBs are identified in the ROD. (Also, PCBs were COCs from the ecological point of view.) Future resident COCs in soil would include, in addition to PCBs, the following chemicals: 1) on-facility - benzo[a]pyrene, chromium, manganese and TCDD and 2) off-facility- chromium and manganese. These chemicals are shown on Table 22 of the ROD. Although the additional soil COCs were identified in EPA's residential risk assessment, on-facility residential use will be prevented by, among other things, institutional controls and on-facility soil will be remedied based on standards for industrial use. Off-facility soil will be remedied to residential standards by the removal of PCBs. Since it is believed that PCBs and these additional COCs in off-facility soil are co-located, excavation of PCBs will simultaneously address these additional COCs in soil.

In considering COCs, EPA also must consider ecological risks, ARARs, TBCs, and migration to groundwater (i.e., chemicals should not be left in soil at levels that would leach into groundwater at significant concentrations). The ARARs, TBCs, and migration-to-groundwater screening numbers are shown on Table 22. The groundwater, surface water, and sediment COCs listed on Table 22 reflect the COCs as listed in the site record since 2004-2005. The soil chemicals on Table 22 include EPA's 2004-2005 COCs (minus soil arsenic, as described above). In addition, the following chemicals exceeding PADEP Act 2 standards were selected as soil COCs: 1) on-facility – tetrachloroethene, naphthalene and lead and 2) off-facility – lead.

The commenter requested that EPA clarify the selection of COCs in on-facility and off-facility groundwater, both in the alluvium and in bedrock.

At this Site, the Work Group identified two areas of the same site as "off" and "on" facility. This can be particularly useful for soil, when different areas may have different uses, institutional controls, and contaminant patterns. In fact, EPA has selected different cleanup goals for soil PCBs "on" and "off" facility to reflect these considerations.

Groundwater, however, is a mobile medium that is not restricted by property boundaries. Groundwater contamination migrates. As indicated in the NCP, EPA expects to restore groundwater to beneficial use. The Breslube aquifers are of potable quality (but for the contamination), and in fact, downgradient of the facility, wells currently exist. Therefore, EPA has selected a comprehensive list of groundwater COCs. This list includes the COCs in bedrock and alluvial groundwater, on- and off-facility. Groundwater outside the Waste Management Area will need to meet ARARs and acceptable risk levels in accordance with the ROD goals and with NCP's Criteria 1 and 2 of the Nine Criteria.

The commenter requested that EPA provide a comparison between the lists of COCs proposed for the ROD versus corresponding lists in the Feasibility Study.

The process for identifying COCs was described above.

The commenter requested that EPA provide a list of COCs present in groundwater within the designated on-facility waste management area, but not elsewhere on or off facility.

As described above, groundwater contamination is mobile, and therefore one comprehensive list of groundwater COCs has been developed to apply to all groundwater outside the waste management area. Some chemicals on this list ultimately may not be found during monitoring, because the remedy has successfully prevented their migration. Other chemicals may have migrated, but at concentrations below the remediation goals. In both such cases, the need for active treatment would not be triggered, and the monitoring for the comprehensive list of COCs serves to demonstrate the protectiveness of the remedy.

However, the monitoring also serves to follow the contaminants that have already been found in wells outside the waste management area. Furthermore, if future migration occurs, the monitoring may demonstrate the need for a more active remedy, and such a need cannot be identified unless the list of COCs is comprehensive.

The commenter requested that EPA clarify the application of Pennsylvania Act 2 medium-specific concentrations (MSCs) as ARARs, including the application of residential (versus non-residential) MSCs and the applicability of a non-used aquifer determination.

The expectation to restore groundwater to beneficial use, and the beneficial use of the groundwater in the Breslube area, were discussed above. EPA guidance is consistent with this expectation of the NCP. As EPA's Risk Assessment Guidance for Superfund notes, "For example, if ground water is not currently used in the area of the site as a source of drinking water

but is of potable quality, future use of ground water as drinking water would be possible." (p. 6-7) In the case of Breslube, there are even drinking-water wells nearby.

APPENDIX VI

Glossary of Terms and Abbreviations

GLOSSARY OF TERMS AND ABBREVIATIONS

Administrative Record (AR) - EPA's official compilation of documents, data, reports, and other information that is considered important to the status of, and decisions made, relative to a Superfund facility. The record is placed in the information repositories to allow public access to material.

Aquifer - An underground geologic formation, or group of formations, contains useable amounts of groundwater that can supply wells and springs.

AOC (Administrative Order on Consent) - A legal agreement signed by EPA and an individual, business, or other entity through which the violator agrees to pay for correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court.

Applicable or Relevant and Appropriate Requirements (ARARs) - Applicable requirements are those clean-up standards, standards of control, and the substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA facility. Relevant and Appropriate requirements are those same standards mentioned above that, while not "applicable" at the CERCLA facility, address problems or situations sufficiently similar to those encountered at the facility that their use is well suited to the particular facility.

Area of Attainment- The area over which groundwater cleanup levels shall be obtained, at the boundary and beyond the edge of the WMA where waste is left in place and throughout the plume of contamination.

ATSDR - Agency for Toxic Substances and Disease Registry

Cap - A protective cover over areas containing wastes or contamination. Caps prevent surface exposure of contaminated soils and sediments and reduce or eliminate infiltration of rain water or other precipitation into the soils or sediments. This minimizes the movement of contaminants from the facility through groundwater or surface water.

Carcinogenic - Cancer-causing

CERCLA - see Superfund

CFR - The Code of Federal Regulations

COC - Contaminant of Concern

COI – Contaminant of Interest

CSA - Coraopolis Sportsmen's Association

CSL - cancer slope factor

Enhanced Monitored Bio-Attenuation - A process in which indigenous or inoculated micro-organisms (e.g., fungi, bacteria, and other microbes) degrade (metabolize) organic contaminants found in soil and/or groundwater, converting them to innocuous end products. Nutrients, oxygen, or other amendments may be used to enhance bioremediation and contaminant desorption from subsurface materials.

Fractured Bedrock - Breaks in underground rock formations caused by folding or faulting.

Facility – Property owned by Breslube-Penn, approximately seven acres in size.

Funnel and Gate - The funnel and gate system for in-situ treatment of contaminated plumes consists of low hydraulic conductivity cutoff walls (the funnel) with a gate that contains in-situ reaction zones. Groundwater primarily flows through high conductivity gaps (the gates).

Groundwater - Water found beneath the earth's surface that fills pores between soil, sand, and gravel particles to the point of saturation. Groundwater often flows more slowly than surface water. When it occurs in sufficient quantity, groundwater can be used as a water supply.

HHRA - human health risk assessment

Hazard Index (HI) - The sum of hazard quotients for substances that affect the same target organ or organ system. Because different pollutants may cause similar adverse health effects, it is often appropriate to combine hazard quotients associated with different substances.

HSCA - Pennsylvania Hazardous Substance Control Act

Information Repository - A location where documents and data related to a Superfund site are placed by EPA to allow the public access to material.

Institutional Controls (ICs) - Some examples of ICs include easements, covenants, well drilling prohibitions, zoning restrictions, and special building permit requirements. Deed restriction is a phrase often used in remedy decision documents to describe easements or other forms of ICs; however, deed restriction is not a traditional property law term and should be avoided. Fences that restrict access to sites are often termed ICs. Because fences are physical barriers instead of administrative or legal measures, EPA does not consider them ICs.

Light Non-aqueous Phase Liquid (LNAPL) - A group of organic substances that are relatively insoluble in water and are less dense than water. LNAPLs, such as oil, tend to spread across the surface of the water table and form a layer on top of the water table.

Maximum Contaminant Levels (MCLs) - Enforceable standards for drinking water supplies promulgated under the Safe Drinking Water Act, 42 U.S.C. §§ 300f-300j. MCLs are referred to as drinking water standards.

MCLGs - Maximum Contaminant Level Goals

MSCs - medium specific concentrations

National Contingency Plan (NCP) - Document which provides the regulatory framework for conducting work under the Superfund program.

Natural Attenuation - the physical, chemical, and biological processes that act, without human intervention, to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in soil or groundwater, in addition to biodegradation, these processes include dispersion, dilution, sorption, volatilization, radioactive decay and chemical or biological stabilization, transformation, or destruction of contaminants.

NPL (National Priorities List) - US EPA's list of the top priority hazardous waste sites in the country that are subject to the Superfund program.

Off-facility – Area of the Site out side the facility boundary.

OSWER - Office of Solid Waste and Emergency Response

PCBs - Polychlorinated Biphenyls – Chlorinated chemicals used in electrical transformers, and formerly used in hydraulic fluids, plasticizers, adhesives, oils and lubricants, and other applications. PCBs include the specific mixtures known as "Aroclors".

PADEP - Pennsylvania Department of Environmental Protection

PADOH - Pennsylvania Department of Health

PAHs - polynuclear aromatic hydrocarbons

Present Worth Costs - The amount of money necessary to secure the promise of future payment, or series of payments, at an assumed interest rate.

PRP – potentially responsible party - under CERCLA, an owner/operator, transporter, or generator of hazardous waste

RAO - remedial action objective

RBC - risk based concentration

RCRA - Resource Conservation and Recovery Act - A statute at 42 U.S.C. §§ 6901 et seq. under which EPA regulates the management of hazardous waste.

Reactive Wall - A technology that involves placing a barrier or "wall" of iron filings across a groundwater plume. The barrier consists of a porous mixture of sand and iron filings. As the contaminated groundwater flows through the wall, chlorinated compounds, such as TCE, PCE,

and vinyl chloride, react chemically with the iron filings to produce chloride and nontoxic hydrocarbons.

Record of Decision (ROD) - A legal decision document that describes the remedial actions selected for a Superfund site, why certain remedial action(s) were chosen as opposed to others, how much they will cost, and how the public's comments about the Proposed Plan were incorporated in the final decision document.

Remedial Action (RA) - The actual construction or implementation phase of a Superfund site cleanup that follows remedial design.

Remedial Design (RD) - A phase of remedial action that follows the remedial investigation/feasibility study and includes development of engineering drawings and specifications for a site cleanup.

Remedial Investigation and Feasibility Study (RI/FS) - A report composed of two scientific studies, the RI and the FS. The RI is the study to determine the nature and extent of contaminants present at a facility and the potential problems caused by their release. The FS is conducted to develop and evaluate alternatives for cleanup of a facility.

RfC - reference concentration for inhaled chemicals - an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups which include children, asthmatics and the elderly) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

RfD - reference dose for ingested chemicals - an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

RI/FS (Remedial Investigation and Feasibility Study) - Stage of cleanup that involves a remedial investigation and a feasibility study. The remedial investigation is an in-depth study to (1) determine the nature and extent of contamination at a Superfund site, (2) establish site cleanup criteria, (3) identify preliminary alternatives for remedial action, and (4) support technical and cost analyses of alternatives. The feasibility study is an analysis of the practicability of a proposal (e.g., a description and analysis of potential cleanup alternatives), which usually recommends

Risk Assessment - The risk assessment is an essential component of the Remedial Investigation Report. This portion of the RI evaluates the carcinogenic and non-carcinogenic risks presented by the contaminants at a site. Risk is calculated both for current uses and potential future uses of the contaminated property by a defined population.

SLERA - Screening Level Ecological Risk Assessments

Superfund/CERCLA (Comprehensive Environmental Response Compensation and Liability Act) - A federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act (SARA) codified at 42 U.S.C. §§ 9601 et seq. The Act created a Trust Fund,

known as the Superfund, which is available to EPA to investigate and cleanup abandoned or uncontrolled hazardous waste sites.

Slurry Wall - A subsurface barrier consisting of a vertically excavated trench that is filled with a slurry. The slurry hydraulically shores the trench to prevent collapse and forms a filter cake to reduce groundwater flow.

SLERAs - Screening Levels Ecological Risk Assessments

SVOCs - Semi-Volatile Organic Compounds - Chemical compounds composed primarily of carbon and hydrogen which have boiling points greater than 200°C.

TBC - be considered

TSCA - Toxic Substance Control Act

TSDF - treatment, storage, and disposal facility

TMV - Toxicity, Mobility or Volume

VOCs - Volatile Organic Compounds- Chemical compounds containing carbon that readily volatilize or evaporate when exposed to the air. These compounds are often used as solvents by industry.

WMA - Waste Management Area